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# HOW TO BECOME A FIREMAN

(Fifth Edition)

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By J. J. O'REILLY, Editor



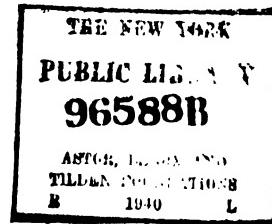
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## P R E F A C E

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It is to meet an ever increasing demand for correct official information relative to the Municipal Civil Service and its requirements that this, the fifth edition of "How to Become a Fireman," is published. Day after day and week after week hundreds of questions are received by THE CHIEF from young men who desire to enter the fire service of the city. Most of these questions, owing to the lack of space, cannot be answered satisfactorily in a newspaper devoted to the general civil service.

More than one thousand of those who prepared themselves through the first, second, third, and fourth editions of "How to Become a Fireman" are now members of the Fire Department.

The experience of the Medical Examiner of the Municipal Civil Service Commission has shown that many applicants are rejected at their medical examination for defects which could have been remedied had the applicant been informed beforehand of the standard of physique required.

The present affords a splendid opportunity for young men to become firemen. The city seeks the best material it can obtain for the position, and the examinations are absolutely impartial.



# **How to Become a Fireman**



## CHAPTER I.

To become a uniformed fireman of the City of New York, you must first conform to the following medical standards. Read the requirements carefully. If you are not certain as to your physical condition, you should have yourself examined, as a preliminary measure, by a reputable physician, in order to be sure that you conform to the standard, and that you are not suffering from ailments and defects which would necessarily cause you to be rejected. The Medical Examiner is prohibited from examining candidates in his private capacity as a physician, and applicants will, therefore, not call upon him for information or special examination.

### **Medical Requirements.**

**Age.**—Not less than twenty-one at time of application, nor more than twenty-nine at time of filing application.

**General Appearance.**—The applicant must be free from any marked deformity, free from all parasitic or systemic skin diseases, and from evidence of intemperance in the use of stimulants or drugs. The

body must be well proportioned, of good muscular development, and show careful attention to personal cleanliness.

Obesity, muscular weakness, or poor physique must reject.

**Nose, Mouth and Teeth.**—Obstruction to free breathing, chronic catarrh, or very offensive breath must reject.

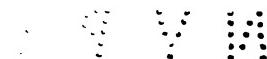
**The Mouth** must be free from deformities or conditions that interfere with distinct speech, or that predispose to disease of the ear, nose or throat.

**Teeth** must be clean, well cared for and free from multiple cavities. There must be at least two molar teeth in each jaw on each side and these teeth in good apposition for proper mastication. The jaws must be free from badly broken or decayed teeth, so far destroyed as to render filling or crowning impossible. Missing teeth may be supplied by crown or bridge work; where site of teeth makes this impossible, rubber dentures will be accepted. At least twenty natural teeth must be present.

**Rupture** in any form must reject.

Any acute and all venereal diseases of these organs must reject.

**Varicose Veins** or a marked tendency to their formation must reject.



**Arms and Legs, Hands and Feet** must be free from afflictions of the joints, sprains, stiffness, or other conditions, such as flatfoot, ingrowing nails or hammer-toes which would prevent the proper and easy performance of duty.

Expan. ins.	Mob. ins.	Height ft. ins.	Weight. lbs.
36½ in .....	3 in.....	5 ft. 8 in.....	140 lbs.
37 in .....	3½ in.....	5 ft. 9 in.....	145 lbs.
37 in .....	3½ in.....	5 ft. 10 in.....	150 lbs.
37½ in .....	3½ in.....	5 ft. 11 in.....	155 lbs.
37½ in .....	4 in.....	6 ft. 0 in.....	160 lbs.
38 in .....	4 in.....	6 ft. 1 in.....	165 lbs.
38 in .....	4 in.....	6 ft. 2 in.....	170 lbs.
38 in .....	4 in.....	6 ft. 3 in.....	175 lbs.
38 in .....	4½ in.....	6 ft. 4 in.....	180 lbs.
38 in .....	4½ in.....	6 ft. 5 in.....	185 lbs.

Height taken barefoot; weight and measurements, naked.

**Eyes.**—The applicant must be free from colorblindness, and be able to read with each eye, separately, standard test types at a distance of twenty feet. Loss of either eye, chronic inflammation of the lids, or permanent abnormalities of either eye must reject.

**Ears.**—Normal hearing with each ear is required.

**Respiration** must be full, easy and regular; the respiratory murmur must be clear and distinct over both lungs, and no disease of the respiratory organs be present.

**Circulation.**—The action of the heart must be uniform, free and steady, its rhythm regular and the heart free from organic changes.

**Brain and Nervous System** must be free from defects.

## CHAPTER II.

### **FORMAL APPLICATION.**

If you conform to the medical standards you should then apply to the Municipal Civil Service Commission for the formal application blank for fireman. These blanks are given out only at stated times, just prior to the holding of a new examination, which is about once in two years.

The following questions must be answered in writing by each applicant and sworn to before a Notary Public.

What is your name in full (your first name in full, your middle initial or initials, if you have any, and your surname in full)?

Are you a citizen of the United States? (If naturalized, your certificate of naturalization must be forwarded with the application. If you claim citizenship through the naturalization of a parent the parent's certificate must be forwarded).

What was the year, month and day of your birth? Where were you born? (If born in the United States, give name of State). If foreign born, state when you came to the United States.

When did your present residence in the State of New York begin? Where do you live?

In what kind of a school were you educated—common school, high school, business college, academy, or college?

Are you married? If so, what family have you?

Have you ever been complained of, indicted for, or convicted of any violation of law? If so, state each occasion and disposition of such charges. Have you ever been complained of, indicted for, or convicted of any violation of law except as above stated?

To what extent, if at all, do you use intoxicating liquors?

What is your height? What is your weight?

Were you ever in the service of the United States, or of any State, or of any County, City or Town? If so, state where and in what capacity. When and why were you separated from such service?

Were you ever in the military or naval service of the United States? If so, in what regiment and company or on what vessel did you serve? Were you honorably discharged, and when? (Your written discharge must be filed with this application).

Have you ever before applied for the position of fireman in the City of New York? If so, when?

State your occupation, the names of your employers and where you have been employed for the last five

years, the past year, the preceding year, the year before that, the year before that, the year before that.

For the convenience of applicants a Notary Public will be found at the office of THE CHIEF.

#### Vouchers For Character.

Four persons must vouch for the character of the applicant. They must be residents of the city. They must have known the applicant at least one year and must not be near relatives of the applicant. It is desirable that one of the vouchers should be a reputable physician. The vouchers must be persons of good character and standing and must not be saloonkeepers.

The applicant is cautioned that inasmuch as the vouchers on the application paper will be called upon for such detailed information as to ability, industry, character, habits, etc., as they can give, he should be careful to secure those who know him well.

Each of the four vouchers must answer the following questions in writing:

How long have you known the applicant? Are you related to the applicant? If so, what is the relationship?

Do you know of any incident in the history of the applicant that might disqualify him for the duties of the position in which he seeks employment?

Is the applicant addicted to the use of intoxicating liquors?

Is the applicant of good reputation and of industrious habits?

Would you yourself trust the applicant with employment requiring undoubted honesty and courage?

Was the applicant ever in your employ? If so, for how long?

Are you connected in any way with the liquor trade?

## CHAPTER III.

### THE EXAMINATION.

His application having been accepted by the Municipal Civil Service Commission the applicant awaits the call of the examiners. The examination is divided into two parts, namely, physical and mental. For each part a weight of 50 is given.

#### Physical Examination.

The necessity for the selection of such men only as are sound in all respects, and are in every way physically qualified for the position is self-evident.

The medical qualifications cited are indispensable, but it is understood that the Medical Examiner will put such other questions or tests, bearing upon each case, as he may think necessary and proper and that the whole examination will be thorough, exact and circumstantial.

The Medical Examiner will also test the strength, activity and physical capacity of all applicants who come up to the standard required in the medical examination, by suitable examination into the strength of back, chest, legs, arms, etc.

The Physical Examiner must fill out and sign the following certificate:

Applicant's No.....

MUNICIPAL CIVIL SERVICE COMMISSION.  
PHYSICAL CONDITION OF

(Write your full name).....

Applicant for.....

Measure-	Per	Prod-
ment.	cent.	W'ght. uct.

Age.... Weight..... .... .... .... ....

Height ..... .... .... .... ....

Sitting Height ..... .... .... .... ....

Girth, Waist—

A .....	.....	.....	5	....
---------	-------	-------	---	------

B .....	.....	.....	4	....
---------	-------	-------	---	------

C .....	.....	.....	2	....
---------	-------	-------	---	------

Girth, Chest—

A .....	.....	.....	1	....
---------	-------	-------	---	------

B .....	.....	.....	2	....
---------	-------	-------	---	------

Girth, Chest, full—

C .....	.....	.....	1	....
---------	-------	-------	---	------

D .....	.....	.....	2	....
---------	-------	-------	---	------

Depth of Chest—

A .....	.....	.....	1	....
---------	-------	-------	---	------

B .....	2 .....
C .....	3 .....
Depth of Abdomen—	
A .....	5 .....
B .....	4 .....
C .....	1 .....
Girth, R. Thigh .....	1 .....
L. Thigh .....	1 .....
R. Upper Arm..	1 .....
L. Upper Arm..	1 .....
Forearm .....	9 .....
Muscular condition .....	9 .....

## Development.....

	Per cent.	Prod- uct. W'ght.
Strength of Back.....	.....	3 .....
Strength of Legs.....	.....	4 .....
Strength of Upper Arm, H. P..	.....	5 .....
Strength of Fore Arm, R. L...	.....	3 .....
Pectorals .....	.....	1 .....
Traction Pull .....	.....	3 .....
Dumb Bells .....	.....	3 .....
Abdominal Muscles .....	.....	3 .....
Adductors .....	.....	1 .....
Agility .....	.....	4 .....

Ladder .....	.....	5	.....
Strength .....	.....	.....	.....
Development .....	.....	1	.....
Strength .....	.....	2	.....
General Physical Condition.....	.....	3	.....

## REMARKS.

I Hereby Certify that I have this.....day of  
.....191....carefully and thoroughly examined the  
above-named applicant, and that the above is a truthful record of such examination.

.....  
Physical Examiner.

Various machines are used for the physical test. The percentage ranges from one to one hundred, and is then multiplied by the weight. The total product is then divided by the combined total of the weights, which in the case of "strength" is 35. For example if in each subject under the heading of strength, an applicant receives, say 70 per cent., the total product would be 2,450. This divided by the total weight, 35 would give the final result for strength, 70.

### Testing Strength of Applicants.

When an applicant has passed the medical examination he is turned over to the physical examiners to test his strength.

Each applicant is required to chin and dip twenty times. Ten of each, or twelve of one and eight of the other, would do, etc. A deduction of five per cent. is taken off for each time less than twenty.

After this the applicants are required to lift a 60 lb. dumbbell over their heads with the right and left hand separately. Proportionate percentage is given for an attempt, even though not successful. Then the applicant must lie on his back, with a 35 lb. dumbbell behind his back, and rise to a sitting position. If the candidate fails a proportionate percentage is given for this. The high jump is the next feat all applicants are required to do. Sixty per cent. is given to those able to jump only three feet six inches; seventy-five per cent. for those who do four feet, eighty-five per cent. for four feet and four inches and one hundred per cent. for those who clear four feet eight inches.

After these feats, the applicants are brought to the machines and each is required to show his strength. First he is to show the strength of his legs and then his back. Special machines are used for these feats.

The grips of the right and left hands are noted. The strength of the chest muscles are noted in the traction pull and pectorals. The strength of the legs is determined by the adductors.

## CHAPTER IV.

### MENTAL EXAMINATION.

Following the physical examination, those who have successfully passed that test must undergo a mental examination. Applicants are examined together.

The mental examination consists of subjects with relative weights as follows:

Memory Test .....	2
Government .....	3
Localities .....	3
Arithmetic .....	2

The questions asked at every examination for fireman since the test of 1901 are here given. These questions enable an applicant not alone to obtain an idea of the line of quiz in his examination, but shows him how far one year's examination questions differ from another. This is regarded as an invaluable record by all teachers.

In 1905, the Municipal Civil Service Commission decided to eliminate the subjects of spelling and rules and regulations of the Fire Department which formally had constituted an important part of the mental test. In place of spelling was given a memory test and gov-

ernment or civics was substituted for the rules and regulations.

### **EXAMINATION, AUGUST 4, 1909.**

#### **Government.**

1. Of the following officials specify those appointed and those elected, and state the length of the term of office in each case: (a) Postmaster; (b) Sheriff; (c) Police Commissioner; (d) Comptroller; (e) Coroner.

2. Specify the official to whom it would be proper for you to complain in each of the following cases:

(1) The plumbing in the apartment house in which you live is out of order and offensive odors arise.

(2.) You suspect that there is a small-pox case in the house adjoining your residence.

(3.) The people next door play the piano all night and your family cannot sleep.

(4.) Letters have been stolen from the letter box in the hall.

(5) The street in front of your house is filthy.

3. At what office is each of the following licenses to be obtained: (a) Marriage; (b) automobile chauffeur; (c) employment office; (d) pushcart; (e) sale of fireworks at retail.

4. Name three courts held in New York City and give the kind of cases tried in each.

5. Which of the following offices are elective and which are appointive: (a) County Clerk; (b) Corporation Counsel; (c) President of a Borough; (d) Surrogate; (e) Register.

### **Localities.**

Take one borough only and answer two of the questions.

Do not take parts of different boroughs.

#### **1. Manhattan.**

1. On what elevated line is there a station at (a) 47th street (b) 30th street; (c) Park Place; (d) 1st street; (e) 76th street? (In each case give avenue along which the elevated line runs and also nearest crosstown surface line to station).

2. Where are the following neighborhoods in Manhattan located: (1) Greenwich Village; (2) Bowling Green; (3) the Speedway; (4) Manhattan Viaduct; (5) Cathedral Parkway?

3. Where are the following buildings located: (1) Police Headquarters; (2) Fire Headquarters, (3) Comptroller's office; (4) West End Theatre; (5) Ansonia Hotel; (6) Fordham Hospital.

**II. Bronx.**

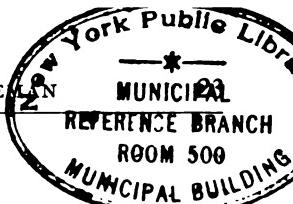
1. Specify the quickest and most convenient method of traveling from 3d. avenue bridge to each of the following places: (a) Harlem Hospital; (b) Botanical Garden; (c) Claremont Park; (d) Borough President's office; (e) Van Cortlandt Park.
2. Name and locate three islands in Bronx waters and specify the public purpose for which each is used.
3. State where each of the following thoroughfares begins and where it ends: (a) Boston road; (b) Tremont avenue; (c) Southern Boulevard; (d) Morris avenue; (e) Westchester avenue.

**III. Brooklyn.**

1. Name four lines of street cars that carry passengers from Brooklyn Bridge to Prospect Park.
2. Tell as near as you can where the following buildings are: (1) The New Academy of Music; (2) the Union League Club; (3) the new Masonic Temple; (4) Temple Bar Building.
3. What is the principal street or avenue running from (a) Hamilton Avenue Ferry to Prospect Park; (b) Prospect Park to Evergreen Cemetery; (c) Evergreen Cemetery to Williamsburg Bridge; (d) Williamsburg Bridge to U. S. Naval Hospital; (e) U. S. Naval Hospital to Bergen Beach (in this case give two of the three streets)?

HOW TO BECOME A FIREMAN

IV. Queens.



1. What localities in New York City would a wagon pass in going from (a) Jamaica to Arverne; (b) Calvary Cemetery to St. Michael's Cemetery?
2. What stations would you pass in going from Long Island City to Aqueduct on the Long Island Railroad?
3. Name two means of transportation in each case from (a) Long Island City to Far Rockaway; (b) Corona to Auburndale. If trolley is named, give trolley line and place of transfer if any. If Long Island Railroad, give division.

V. Richmond.

1. What is the quickest way for a messenger to go from Fire Headquarters, Borough Hall, to Dongan Hills?
2. (a) Where is the Staten Island Academy? (b) the Curtis High School? (c) the Richmond County Country Club? (d) St. Vincent's Hospital?
3. What is the best route for the Hook and Ladder Company to go from Castleton avenue, West New Brighton to the Richmond Theatre?

**Arithmetic.**

Give all the figuring on the ruled sheets.

1. A coal merchant sold 674,849 tons on Monday  
783,486 on Tuesday, 549,853 on Wednesday, 766,87<sup>9</sup>  
on Thursday, 976,021 on Friday, 432,849 on Saturday  
How many tons did he sell in the week?

2. The population of one city is 842,026 and that of  
another is 487,987. What is the difference?

3. If an oil well produces 8,437 gallons a day, how  
many gallons will it produce in 609 days?

4. If 3,586,902 stones are divided into 8,796 equal  
heaps, how many stones are there in one heap?

**EXAMINATION THURSDAY, AUGUST 5, 1909.****Government.**

1. How do the following officials secure their positions: (a) The District Attorney; (b) the Corporation Counsel; (c) the Deputy Fire Commissioner for the Borough of Brooklyn; (d) judges of the Supreme Court (e) City Magistrates?

2. What department of the city government can attend to the following complaints: (a) The fire escapes in a tenement house are encumbered with household goods; (b) the fire escapes in a tenement house are

so rusty that they may break and fall at any time; (c) a theatre has no fire escapes?

3. Where should a person apply (a) for a license to conduct a theatre; (b) for a permit to keep explosives; (c) for a permit to open a street; (d) for a permit to sell kerosene oil?

4. Where would the following cases be tried: (a) A charge against a fireman for disobeying orders of a superior; (b) a suit against a fireman to recover the cost of his uniform; (c) a suit by a dismissed fireman for reinstatement in the department?

5. By whom are vacancies in each of the following positions filled: (1) New York City Civil Service Commissioner; (2) Chief of Fire Department; (3) Sergeant of Police; (4) Police Magistrate; (5) Superintendent of Insurance?

### **Localities.**

Take one borough only and answer two of the questions.

Do not take parts of different boroughs.

#### **I. Manhattan.**

1. What is the nearest elevated station to each of the following: (In each case give "L" line and state how

you would reach the place after leaving station). (a) Office of Board of Health; (b) Fire Headquarters; (c) Metropolitan Museum of Art; (d) Aquarium; (e) Thomas Jefferson Park?

2. State five (5) bridges that connects the Borough of Manhattan with other parts of New York City and give the location of the Manhattan approach to each.

3. Locate the following buildings: (1) United States Assay Office; (2) United States Army Building; (3) Barge Office; (4) Produce Exchange; (5) Lenox Library; (6) Flower Hospital.

## II. Bronx.

1. Give the location of each of the following: (1) Seaton Hospital; (2) Ursuline Convent; (3) Mt. St. Vincent Academy; (4) ferry to North Brother Island.

2. Name the subway or elevated station nearest to (a) Borough Hall; (b) Eichler's Brewery; (c) Morris High School; (d) St. Joseph's Hospital.

3. What means of transportation would you take to go from (a) Madison Avenue Bridge to Fort Schuyler; (b) from 132d street and Willis avenue to New Rochelle; (c) from Lincoln Hospital to Westchester Village; (d) from Woodlawn Heights to Saint Mary's Park; (e) from Bronx Kills to Spuyten Duyvel?

### III. Brooklyn.

1. How would you direct a citizen at Willnick entrance, Prospect Park, to go most directly by trolley to (a) Williamsburg Bridge; (b) Borough Hall; (c) Coney Island; (d) 39th Street Ferry?
2. Locate the following small parks: (a) Bushwick Park; (b) Carroll Park; (c) Tompkins Park; (d) Cooper Park; (e) City Park.
3. Name three elevated lines and four street car lines which carry passengers from the Brooklyn Bridge to Coney Island.

### IV. Queens.

1. What would be the most direct route for a fire engine to take to go from (a) the County Court House to the Woodside car barns; (b) Fulton street, Jamaica, to College Point?
2. Through what localities would you pass in going from Long Island City to Jamaica by trolley?
3. What two means of transportation could you take to go from (a) Murray Hill to Jamaica (b) Hollis to Brooklyn? (If trolley is named, give trolley line. If Long Island Railroad, give division. If transfer is necessary, give place of transfer).

### V. Richmond.

1. What car lines would you take from the office of the Chief, 21st Battalion, Richmond road, Stapleton to the Fire Department store house, 80 Jersey street, New Brighton?

2. (a) What is the best route for a fire engine to take, to go from Mariner's Harbor to the Marine Hospital? (b) What is the best route for a fire engine to take to go from Richmond to the Mount Loretta Mission?

3. Locate four public schools. What is the most direct way of reaching those mentioned by you from the Municipal Ferry House at Stapleton?

### Arithmetic.

To be finished by 4 p. m.

Give all the figuring on the ruled sheets.

1. In January a merchant sold 780,965 feet of lumber; in February 893,602; in March 548,327; in April 659,838; in May 198,875; in June 927,438. How many feet in all?

2. At an election one candidate received 723,400 votes and another 586,907. What was the majority?

3. If a car can carry 7,689 packages, how many packages can be carried in 708 cars?

4. If 5,622,144 bricks are arranged in 7,986 even rows, how many bricks are there in a row

**FRIDAY, AUGUST 6, 1909.**

**Government.**

To be finished by 1 p. m.

1. Name the officials in charge of the following: (a) Care of Riverside Drive; (b) caring for the insane; (c) deciding questions concerning wills; (d) removing street obstructions.
2. State briefly the duties attached to the following offices: (1) County Clerk (2) Fire Marshal; (3) Commissioner of Licenses; (4) City Chamberlain.
3. Specify a violation of law that may be tried and disposed of in the following courts: (a) Magistrate's Courts; (b) Courts of Special Sessions; (c) General Sessions; (d) Supreme Court.
4. What Board, Department or Official attends to (a) Newsboys' Licenses; (b) Working Certificates to boys of 14; (c) Laying out of Subway Routes; (d) Building Reservoirs?
5. What City Department has charge of (a) Potter's Field; (b) Aquarium; (c) Ferry to Staten Island; (d) Tombs; (e) Morgue?

**Localities.**

Take one borough only and answer two of the questions.

Do not take parts of different boroughs.

**I. Manhattan.**

1. What rapid transit stations are near (a) Cooper Union; (b) College of the City of New York; (c) Tribune Building; (d) Trinity Church; (e) Hippodrome? (Give two in each case).
2. What is the quickest route by public conveyance from Fire Headquarters to each of the following: (a) Police Headquarters; (b) Van Cortlandt Park; (c) Uptown West Shore Railroad Ferry; (d) Astoria Ferry; (e) Columbia University?
3. State the most direct route in driving between (1) Metropolitan Museum of Art and Bellevue Hospital; (2) Bellevue Hospital and Old Astor House; (3) Washington Square and Williamsburg Bridge; (4) Williamsburg Bridge and Columbus Circle.

**II. Bronx.**

1. How would you travel by trolley from 128th street and Third avenue to each of the following places: (

Throgg's Neck; (b) Woodlawn Cemetery; (c) Clason's Point; (d) Port Morris; (e) Westchester Public Library?

2. Name the stations on the Subway and its extension in the Bronx and also the stations on the Third Avenue Railroad above 133d street.

3. What line of trolley cars goes to Westchester? (b) What line goes to the Washington Bridge? (c) What line goes to Van Cortlandt Park? What line goes to Woodlawn? (e) What line goes to McComb's Park?

### III. Brooklyn.

1. Locate the following; (a) The 23d Regiment Armory; (b) Troop C Armory; (c) Long Island Hospital; (d) Brooklyn Club.

2. By what line of transportation would you travel from Borough Hall to (1) Ridgewood reservoir; (2) Canarsie Beach; (3) Bay Ridge; (4) Red Hook?

3. (a) Give the route of the Bushwick avenue trolley line from Williamsburg Bridge to Ridgewood. (b) Give the route of the Greene and Gates avenue line from Brooklyn Bridge to Ridgewood.

### IV. Queens.

1. What is the most direct route for a wagon to take to go from (a) Borough Hall to Maple Grove Cemetery; (b) Flushing Bridge to Elmhurst?

2. What is the most direct route and through what localities would you pass in going by trolley from (a) Donnelly's Grove to Greenpoint, Brooklyn; (b) St. John's Cemetery to Newtown Creek?

3. (a) Name three ways of reaching Manhattan Borough from Flushing. (b) Name two ways of reaching Lutheran Cemetery from Long Island City?

If trolley is named, give name of trolley line. If Long Island Railroad give the division. If ferry, give location of ferry house in both boroughs.

#### V. Richmond.

1. (a) What is the best route for the engine company at Tottenville to take to go to St. Michael's Home at Greenridge; (b) What is the best route for the engine company at Rosebank to take to go to a fire at Linoleumville ?

2. (a) Where is the County Court House; (b) Elm Park; (c) Clove Lake; (d) the Smith Infirmary?

3. What is the most direct route by public conveyance from St. George ferry to (a) Castleton Corners; (b) Great Kills; (c) the Moravian Cemetery?

#### Arithmetic.

To be finished by 4 p. m.

*Give all the figuring on the ruled sheets.*

1. A library lends 489,756 books one year, 876,409 the next, 567,848 the next, 763,489 the next, 438,752 the next, 927,643 the next. How many were lent in all?
2. One farm has 724,300 acres; another, 289,705. What is the difference?
3. If a steamship burns 6,489 tons of coal in one day, how many tons would it burn in 608 days?
4. If 7,289 spools hold in all 2,245,012 feet of thread, how much does one spool hold?

### **EXAMINATION FEBRUARY 7, 1907.**

#### **Memory Test.**

Orders have come from headquarters to investigate a charge that an officer of this Department interfered with a U. S. mail wagon at the fire at Broadway and 42d Street. You are directed to look into the matter at once and make a report without delay.

#### **Government.**

1. What matters are controlled by the Department of Water Supply, Gas and Electricity?
2. Name the City Departments having charge of
  - (a) The inspection of steam boilers.

(b) Public Markets.

(c) Vaccination of school children.

(d) Care of street lamps.

(e) Public ferries.

3. What government (Federal, State, County or Borough) has control of Collection of the on Imported Goods, Murder Trials, the Building of Private Residence in New York City, and the Management also the Cleaning of Streets?

4. Give one reason in each case why the city is necessary to look after

(a) Places where explosives are kept for sale.

(b) Employment agencies.

(c) Pawnbrokers.

(d) Boilers in buildings.

(e) The sale of milk.

5. From what city official or department must a permit or license be obtained for each of the following?

(a) To sell milk at retail.

(b) To conduct a newspaper stand under an elevated railroad station.

(c) To use blasting powder.

(d) To conduct a pawnbroking business.

### **Localities.**

Take one borough only.

**I. Manhattan.**

1. What is the character of the buildings on the following blocks:

- Broadway, 8th Avenue, 57th and 58th Streets.
- Park Avenue, Lexington, 50th and 51st Streets.
- 44th to 46th Streets, East of 1st Avenue.
- 13th and 14th Streets, Broadway and 4th Avenue.
- 13th, 14th, 9th and 10th Avenues.

2. Along what streets or avenues would a person pass in walking

(a) From the Hotel Astor (new) to the old Astor House.

(b) From the Astor House to the Waldorf-Astoria Hotel.

- (c) From the Waldorf-Astoria to the Astoria Ferry.
- (d) From Astoria Ferry to Astor Library.
- (e) From Astor Library to Astor Theatre.

3. Locate by streets each of the following buildings and state what Elevated R. R. station is nearest to each.

- (a) Normal College.
- (b) Union Dime Savings Institution.
- (c) Seventy-first Regiment Armory.
- (d) Manhattan Opera House.
- (e) New York Sub-Treasury.

4. Where are the following districts or neighborhoods? (Give boundaries as far as possible).

- (a) San Juan Hill.
- (b) Gramercy Park.
- (c) Hell's Kitchen.
- (d) Kingsbridge.
- (e) Chinatown.

5. What sort of buildings will be found in the sections having the following boundaries? (Answer with special reference to character of building, that is, whether residence or business, fireproof or not, crowded or vacant, etc.).

- (a) 41st and 43d Streets, 7th and 8th Avenues.
- (b) 56th and 58th Streets, 5th and 6th Avenues.
- (c) 22d and 23d Streets, 5th and 7th Avenues.
- (d) 15th and 20th Streets, Broadway and Irving Place.
- (e) 52d and 54th Streets, 8th and 11th Avenues.

## II. Brooklyn.

1. What streets run about (a) East and West, between the East River and Court Street at Atlantic Avenue? (b) East and West between the East River and Newtown Canal on the north side of Greenpoint Avenue. (c) Northwest and Southeast between Broadway and Wyckoff Avenue at Putnam Avenue. (d)

East and West between Nostrand and Schenectady Avenues and Bergen Street.

2. Give the routes of the following surface railroad lines: (a) Church Avenue line; (b) Marcy Avenue line; (c) Lorimer Street line.

3. Give the principal boundaries of the following: (a) Greenwood Cemetery; (b) Fort Greene; (c) U. S. Navy Yard; (d) Tompkins Park.

4. What is the distance in miles from the Borough Hall to the following places: (a) Holy Cross Cemetery; (b) Bushwick Park; (c) Washington Cemetery; (d) Winthrop Park.

5. Locate the following: (a) Erie Basin; (b) Hanover Club; (c) Adelphi Academy; (d) St. John's College; (e) Kings County Hospital.

### III. Bronx.

1. Give the location, as far as possible, with street boundaries of each of the following. (a) Van Cortlandt Park; (b) Port Morris; (c) City Island; (d) Mott Iron Works; (e) Catholic Protectory.

2. At what station of the elevated railroad or subway extension would you get off so as to reach most conveniently (a) The Fire Commissioner's office, Claremont Park; (b) Lebanon Hospital; (c) Fordham College; (d) The Zoological Garden; (e) Morris High School.

3. How would you travel, using street or steam cars from Kingsbridge subway terminal to the office of the Coroner for the Bronx, and thence to the office of the Park Commissioner for the Bronx? Name every street used.
4. Name the streets used by the cars of (a) the Port Morris line; (b) the Sedgwick Avenue line; (c) the Southern Boulevard line; (d) the Tremont and Westchester line; (e) the West Farms and Williamsbridge line.
5. Name at least four bridges stretching from the Bronx to Manhattan and specify the streets or avenues connected by each bridge.

#### IV. Queens.

1. Locate three different places in the Borough of Queens where factories and tenement houses make the locality dangerous in case of fire.
2. State the places in the Borough of Queens where the city has already established the paid Fire Department.
3. Name five Volunteer Fire Departments or Companies which are now operating in the Borough of Queens.
4. (a) Name five stations of the Long Island Railroad situated in the Third Ward (former town of

Flushing). (b) Through what waters would you pass in sailing from Flushing Creek to Bayside?

5. Which of the following are manufacturing districts: Woodhaven, College Point, Auburndale, Ramblersville, Elmhurst, Astoria, Hollis, Hunter's Point, Creedmore, Glendale? (b) Give the most direct way of reaching those named by you from the Borough of Manhattan. If trolley is given, mention trolley line. If L. I. R. R., give division and name of station.

#### V. Richmond.

1. By what bodies of water is Staten Island surrounded? Name all.
2. Name the lines of the Staten Island Rapid Transit R. R. and give their terminal points.
3. On which of those lines are the following towns: Princess Bay; Port Richmond; Rosebank; Snug Harbor; New Dorp.
4. Locate the following offices: President of Borough; Coroner; Board of Health; County Clerk; Tax Offices.
5. Locate the following highways and name the points connected by them: Richmond Turnpike; Clove Road; Amboy Road; Richmond Road.

**Arithmetic.**

1. A man bought 9 shirts at 80 cents apiece; 2 ties at 35 cents each; 10 collars at 25 cents apiece; a pair of gloves for 75 cents, and 2 suits of underwear at 95 cents a suit. What did the man pay for them altogether?
2. If 295 miles of canal in the U. S. cost \$541,475, what was the cost of each mile?
3. A grain dealer bought 2480 bushels of wheat on Monday; 788 bushels on Tuesday; 1565 bushels on Wednesday; 2684 bushels on Thursday; 985 bushels on Friday, and 3867 bushels on Saturday. How many bushels did he buy during the week?
4. If in one year the Fire Department of New York cost \$9,750,684, and that of Chicago cost \$4,690,853, how much more did one cost than the other?

**EXAMINATION, 1904.****Memory Test.**

It is reported that the fire hydrant at the corner of 40th street and Lexington Avenue is not working properly. Go there, find out exactly what is the matter, telephone the facts from the nearest fire house and then *return to headquarters to make a written report.*

**Government.**

1. Name three Departments of the City of New York, besides the Fire Department, and state briefly, the kind of business of which each has charge.
2. What is the law-making body of the State? Into what two branches is it divided? Who chooses its members?
3. Is the control of the liquor business in this City exercised by the State or the City?
4. Has the Mayor of the City any power in connection with acts of the Legislature affecting the City of New York? State what you know about this matter?
5. What body passes ordinances? What do you understand to be an ordinance. Give an example of an ordinance.

**Arithmetic.**

1. Five houses contain the following number of bricks: 39417, 45652, 28799, 41034 and 37098. How many bricks were there in all?
2. There are 1760 yards in a mile. How many miles in 1,001,440 yards?
3. A's fortune is \$125,334, which is \$18,625 more than B's. How much has B?
4. If the water supply for a city averages 3,456,789 gallons daily, how many gallons would support it for 359 days?

### Localities

Take one borough only and no more. Do not take parts of different boroughs.

#### I. Manhattan.

1. Name three street railway lines by which a person may travel from the Battery to the Harlem River without changing, and give the streets over which the cars run.
2. State as nearly as you can tell, the distance from (a) 59th Street to High Bridge; (b) Battery to 125th Street; (c) Grant's Tomb to St. Patrick's Cathedral; (d) East to North River along Houston Street.
3. Give the location of (a) the Hotel Savoy; (b) the Hotel Majestic; (c) Trinity Church; (d) Washington Arch; (e) University Club.
4. Beginning at 59th Street, name in succession the first ten stations on the Sixth Avenue "L" road; also the first ten stations below 59th Street on the Second Avenue "L".
5. At what streets in Manhattan are the following ferries: (a) Astoria Ferry; (b) Fort Lee Ferry; (c) Ellis Island Ferry; (d) Weehawken Ferry; (e) Green-point Ferry.

## II. Brooklyn.

1. Give as nearly as you can the distance from the Brooklyn Borough Hall to (a) Fulton Ferry; (b) Coney Island; (c) Greenwood Cemetery; (d) Prospect Park.
2. Give the exact location of any five of the following places: (a) Police Headquarters; (b) Grand Opera House; (c) City Park; (d) Cypress Hills Cemetery; (e) Gayety Theatre; (f) Department of Public Charities; (g) County Jail; (h) Wallabout Market; (i) 47th Regiment Armory; (j) Winthrop Park.
3. Where do the following-named streets begin and end: (a) Atlantic Avenue; (b) Broadway; (c) Ocean Parkway; (d) Myrtle Avenue?
4. Which of the following-named places are in the Borough of Brooklyn and which are not: Calvary Cemetery, Erie Basin, Manhattan Beach, Mount Olivet Cemetery, Kings Highway, Elmhurst, the Truant Home, Bergen Beach, Eastern Parkway, Windsor Terrace?
5. Name any five stations on (a) Fulton Street elevated railway between Flatbush and Utica Avenue; (b) Fifth Avenue between St. Marks Place and 65th Street.

### III. The Bronx.

1. Name the points at which the following thoroughfares begin: (a) Westchester Avenue; (b) Boston Road; (c) Southern Boulevard; (d) Jerome Avenue; (e) Prospect Avenue.
2. Give the location of (a) Zoological Gardens; (b) Morris High School; (c) the Catholic Protectory; (d) Lebanon Hospital; (e) City Hospital.
3. Name five streets or avenues in the Borough of the Bronx in which tenement house population largely prevails.
4. Give the boundaries of that section of the borough in which an extensive fire would threaten great destruction to property.
5. Name three railroad systems which furnish rapid transit facilities to the people of Bronx Borough.

### IV. Queens.

1. In what parts of the Borough of Queens are the following: Clarenceville, Springfield, Middle Village, Bayside, Edgemere, Murray Hill, Aqueduct.
2. Name two streets or avenues which comprise the most direct route from Long Island City to Jamaica: (b) Name street or avenue leading from Hunter's Point to Corona; (c) Name street or avenue leading

from Flushing to Jamaica; (d) Name street or avenue leading from Brooklyn Borough to Corona.

3. Give locations of the following: (a) Union Field Cemetery; (b) Little Neck Bay; (c) Oakland Lake; (d) Wave Crest.

4. (a) Give location of four (4) public school buildings in Long Island City; (b) Name and locate three well known manufacturing buildings in Flushing and College Point; (c) Name and locate the largest public park in the Borough of Queens; (d) Give exact location of the National Rifle Association.

5. Name and locate four (4) well known excursion resorts in the Borough of Queens and state exactly what means of transportation you would take to go to each, starting from Long Island City. If by L. I. R. R. give the division by which you would travel. If by trolley, name trolley line.

#### V. Richmond.

1. Name all the lines of communication between Staten Island and the main land and give their location.

2. What are the two largest and most important trolley lines on the island and through what section do they run?

3. Locate the following: (a) Fire Department Headquarters; (b) County Clerk's Office; (c) Department of Buildings; (d) Tottenville Pump Station; (e) Tax Office.

4. In going from Princess Bay to New Dorp by the most direct route, what small towns would you pass through?

5. Locate the following towns: (a) Tottenville; (b) Port Richmond; (c) Tompkinsville; (d) Castleton Corners; (e) Fort Wadsworth.

### **EXAMINATION, 1903.**

#### **City Information.**

1. By what line of street cars can a person travel without change from the New York Postoffice to Fort George? Over what streets and avenues do the cars of this line pass?

2. Name five streets in Manhattan, crossing Broadway, between Central Park and Houston Street, on which cars run.

3. Give the names and locations of a prominent church, two of the best known hotels, and two other prominent buildings on Fifth Avenue, between 59th and 33d Streets.

4. Give the location of the (a) Tombs Prison; (b) the new Hall of Records; (c) the Criminal Courts Building, and (d) Cooper Union in the Borough of Manhattan.
5. Indicate as near as you can the location of (a) the Borough Hall; (b) the Erie Basin; (c) the Navy Yard, in the Borough of Brooklyn.
6. Name a line of cars running from the Brooklyn Bridge to Coney Island points.
7. Where do Fulton Street and Broadway, Brooklyn, begin, and where do they come together?
8. Name a village in the extreme southern end of Staten Island and one at the extreme northern end.
9. Name two popular beaches in Queens Borough and tell on what body of water each is located.
10. Name two lines of railway by which a person may travel from the Third Avenue Bridge to Bronx Park.

#### **Rules and Regulations.**

1. The rules state that no person shall be appointed to membership in the Fire Department who has been convicted of a felony. What is a felony?
2. Members of the force are required to "promptly cause all persons in the burning or adjoining premises to be removed therefrom with the least possible in-

jury to life or limb." State under what circumstances you would consider it necessary to remove persons from an adjoining building, and, assuming any state of facts you please, state precisely what you would do.

3. Give in your own language, what you understand to be the meaning of the following words or phrases: (a) Evade any duty; (b) prejudicial to good order, welfare or reputation; (c) prescribed by the School of Instruction; (d) immediate superiors; (e) solicit.

4. Suppose the wife of a fireman appears at quarters and wishes to see her husband because she has been threatened by a dealer on the installment plan to take away her bed for non-payment. What is the duty of the watchman?

5. Suppose that you and another member of your company live in adjacent flats, and your fellow member insists upon allowing his fire escape to be obstructed after you objected. State precisely your duty in the case.

### Arithmetic.

1. Ten carloads of lumber measured, respectively, 13,841 feet, 12,999 feet, 15,213 feet, 12,796 feet, 14,625 feet, 12,537 feet, 15,008 feet, 14,742 feet, 13,984 feet and 14,720 feet. How many feet were there altogether?

2. A had \$11,453 and B \$4,329 more; A gained \$2,645 and B lost \$2,934. Which, then, had the more, and how much?
3. If a man plants 1296 hills of corn in a day, how many hills could 32 men plant in 29 days?
4. An army of 120,000 men was divided into regiments of 960 men each. How many regiments were formed?

### **EXAMINATION, 1902.**

#### **Rules and Regulations.**

1. What do you believe to be the reason for the rule that no resignation will be accepted when charges are pending?
2. The duties of the housewatch may be divided into three heads: (a) What must be done; (b) what may not be done; (c) for what is it responsible? Give two samples under each head.
3. You suspect a fire to be of incendiary origin. Without quoting the rule on the subject, state precisely what you would do in such case.
4. You are sent from quarters to inspect premises where it is alleged that a fire escape is obstructed. Make out in full a report such as the rules require.

### City Information.

1. Bound carefully the Borough with which you are acquainted and give the direction of the terminal points and the approximate length of the two longest dimensions.
2. State where the office of the Borough President of the Borough chosen in answer to question 1, and give the quickest route from it to the office of the Borough President of Manhattan in question 1, give the quickest routes to the office of the Borough President of the Bronx.
3. Name one hotel, in any borough, which you consider particularly safe, from a fireman's point of view, and give reasons for your selection.
4. Name the longest continuous thoroughfare in the Borough you selected in question 1, state what if any, surface cars run on it and name one important building on it.
5. Name a steam road in your Borough. State precisely where it starts or enters the Borough and where it leaves it, and give the terminals of the road.

### Arithmetic.

1. Add.
2. Subtract.
3. Multiply.
4. Divide.

**Experience.**

1. State in what school or schools you received your education; the length of time spent, and the age when leaving school.
2. What has been your employment since leaving school? Give full particulars.
3. How are you now employed?
4. If you have left any employer within the last five years, give full reasons for doing so.
5. Give any facts, not mentioned above, which throw light on your qualifications for the position of fireman.
6. Give names and addresses of two or more persons to whom we may refer, if considered necessary for verification of the above statements.

**EXAMINATION, 1901.****Spelling.**

Extract, quarters, assigning, applies, highest, applicant, disapproved, solicit, influence, theatrical, festival, spirituous, beverage, gamble, liquors, precautionary, cornice, weight, descend.

**Memory Test.**

It has been reported that the pavement on Madison Avenue, between Forty-first and Forty-second Streets,

has been torn up so that an engine could not safely pass through. Go there, ascertain the facts and bring back an exact report of them.

### **Rules and Regulations.**

1. In what places are members allowed to smoke while in uniform?
2. State fully what would be your duty should you observe any person refusing the apparatus of the department the lawful right of way?
3. Under what condition or conditions is a fireman permitted to receive a present or reward from a citizen?
4. State: (a) What officers are responsible for receiving alarms; (b) the duties of such officers in full, upon the receipt of an alarm?
5. Give the substance of the regulation regarding applications for promotion.
6. State in what connection and with what meaning the following words and phrases are used in the book of rules:
  - (a) "General, special or verbal."
  - (b) "Recover."
  - (c) "Detimental."
  - (d) "Endorsement."
  - (e) "Giving full particulars in the return."

## CITY INFORMATION.

### **Manhattan and The Bronx.**

1. If a serious fire should break out at the Riverside Hospital for Contagious Diseases, by what route could a messenger be sent from Fire Headquarters to that place? How would the Department be most likely to handle the fire?
2. What prominent buildings are situated as follows:
  - (a) Corner Third Avenue and Eighth Street.
  - (b) Madison Avenue, between 26th and 27th Streets.
  - (c) Corner of Brook Avenue and East 143d Street.
  - (d) Corner of Fulton and Pearl Streets.
  - (e) Corner Sixth Avenue and 55th Street.
3. What corporation would suffer heavy loss from a fire on the North River front, between 59th and 72d Streets?
- What large buildings are situated in that section of the city?
4. Name the different lines of surface cars that run to Grand Street Ferry. Mention in each case the principal streets through which the cars pass.
5. Locate exactly any five of the following:
  - (a) Kips Bay Brewing and Malting Company.

- (b) Colwell Lead Company's Shot Tower.
- (c) N. Y. and H. R.R. Freight Depot.
- (d) Eighth Regiment Armory.
- (e) Church of the Paulist Fathers.
- (f) United States Sub-Treasury.
- (g) Altman's Department Store.
- (h) St. Luke's Hospital.
- (i) American Line Pier.

**Brooklyn.**

1. (a) What engine is nearest to the Brooklyn Navy Yard, and what route would be taken in going to a fire at that place?
  - (b) Where is the office of the Fire Marshal?
2. Locate ten of the following:
  - (a) Main office of Brooklyn Rapid Transit.
  - (b) Municipal Building.
  - (c) Sheriff's Office.
  - (d) Ft. Greene Park.
  - (e) The Morgue.
  - (f) U. S. Naval Hospital.
  - (g) Armory of the Third Battery.
  - (h) Montauk Club.
  - (i) U. S. Grant Equestrian Statue.
  - (j) Grand Opera House.
  - (k) City Savings Bank.

- (l) Twenty-sixth Ward Bank.
- (m) Special Sessions Court.
- (n) Salem Fields.
- (o) St. Ann's Protestant Episcopal Church.
- (p) Brooklyn Furniture Company.

3. What are the principal streets through which the Ridgewood elevated trains run, and at what points on this line can you transfer and to what lines? By what trolley lines can you go to Brighton Beach?

4. (a) By what trolley line would you go from Court and Joralemon Streets to corner of Driggs and Manhattan Avenues? (b) What are the principal streets through which you would pass?

5. (a) By what line would you go to Fresh Pond Crematory from Borough Hall? (b) Through what streets and through what section of the city would you pass?

6. Candidates need answer but one section of these questions: What is the general character of property —(a) bounded by Nostrand Avenue, Dean Street, Bedford Avenue and Bergen Street; (b) bounded by Broadway, Marcy Avenue, Division Avenue and Bedford Avenue.

7. What buildings are situated on Kent Avenue, near Broadway ferries which would give trouble to the Fire Department in handling a large fire? Give your reasons.

8. (a) What official has charge of the Fire Department in Brooklyn, and who holds that position now? (b) Upon what companies does this department depend in fires along the water front?

### Arithmetic.

1. Add: 769,847 ; 955,768 ; 867,539 ; 748,967 ; 863,976.
2. Subtract:           320,012  
                          199,999.
3. Multiply: 47,089 x 6,095.
4. Divide: 1,959,048 by 4,789.

### Experience.

Handwriting will be rated on answers to this paper.  
Answer the following fully:

1. State in what school or schools you received your education; the length of time spent at school, and age when leaving school.
2. What has been your employment since leaving school? Give full particulars.
3. How are you now employed?
4. If you have left any employer within the last three years, give full reasons for doing so.
5. Give any facts, not mentioned above, which throw light on your qualifications for the position of fireman.

## CHAPTER V.

### ANSWERS TO QUESTIONS.

**EXAMINATION, WEDNESDAY, AUGUST 4, 1909.**

#### **Government.**

Question 1—a-Postmaster appointed by the President; b-Sheriff elected by the people; c-Police Commissioner appointed by the Mayor; d-The Comptroller elected by the people; e-Coroner elected by the people.

Question 2—1-Health Department; 2-Health Department; 3-Police; 4-Police and Post Office Departments; 5-Health.

Question 3—a-City Clerk; b-Secretary of State; c-Department of Licenses; d-Bureau of Licenses in Mayor's Office; e-Bureau of Combustibles in Fire Department.

Question 4—Supreme Court decides cases of law and equity; Surrogate's Court has jurisdiction over will and inheritance cases; Coroner's Court has charge of inquiry into the causes of sudden and suspicious deaths.

Question 5—a-Elective; b-Appointive; c-Elective; d-Elective; e-Elective.

**Thursday, August 5th, 1909.**

Question 1—a-By election; b-By appointment; c-By appointment; d-By election; e-By appointment.

Question 2—a-Tenement House Department; b-Building Department; c-Fire and Building Departments.

Question 3—a-Police Department; b-Fire Department; c-Bureau of Street Openings; d-Fire Department.

Question 4—Before Fire Commissioner or one of his deputies; b-Municipal Court; c-Supreme Court.

Question 5—1-By the Mayor; 2-By Fire Commissioner after a competitive examination has been held; 3-By Police Commissioner after a competitive examination has been held; 4-By the Mayor; 5-By the Governor.

**Friday, August 6th, 1909.**

Question 1—a-Park Commissioner; b-Commissioner of Charities; c-Surrogate; d-Building Department.

Question 2—1-County Clerk has charge of the public records and is clerk of the county or Supreme Court which meets in his county; 2-Fire Marshal investigates the origin of fires and looks into the enforcement of the laws relating to fires; 3-The Commissioner of Li-

censes has supervision over the licensing of employment bureaus; 4-City Chamberlain receives all monies and deposits them in such banks as provided for, by or in the Charter.

Question 3—a-Cruelty to animals; b-All misdemeanors except libel; c-Murder; d-Cases of law and equity.

Question 4—a-Board of Education; b-Board of Health; c-Public Service Commission; d-Department of Water Supply, Gas and Electricity.

Question 5—a-Department of Health; b-Department of Parks; c-Department of Docks and Ferries; d-Department of Corrections; e-Department of Charities.

### **EXAMINATION, FEB. 7, 1907.**

#### **Government.**

1—This department has jurisdiction over all property connected with the supply and distribution of water for public use, including all the fire and other hydrants and water meters; the maintenance of a pure and sufficient supply of water; the collection of water rates; the enforcement of ordinances concerning the use of water; the making of contracts for the use by the city of gas and electricity for purposes of illumination, and the transmission in conduits of gas, steam,

pneumatic power, and electricity through and under streets and other public places and for all uses.

2—a-Police Department; b-Finance Department; c-Department of Health; d-Water Supply, Gas and Electricity Department; e-Department of Docks and Ferries.

3—a-Federal government collects tariff; County government has control of murder trials; City government has charge of building in New York City; State government has charge of the militia; City government has charge of the cleaning of streets.

4—a-To prevent conflagrations and accidents; b-To prevent the robbery of those seeking employment by unscrupulous agencies; c-To protect property and to detect thieves who pawn stolen goods; d-To safeguard human life; e-To guarantee the sale of pure milk.

5—a-Health Department; b-Aldermen; c-Police Department; d-Mayor's Office.

## **EXAMINATION, 1904.**

### **Government.**

1—Police Department has charge of the protection of life and property. Water Supply, Gas and Electricity Department has charge of the water supply of the city and the lighting of public streets; Street Clean-

ing Department has charge of the cleaning of the public streets.

2—Legislature; Assembly and Senate; The people or voters of the State.

3—By both State and City, the former being in charge of the Excise Department and the latter in charge of the carrying out of the law.

4—The Mayor may veto any bill which directly affects this city; the measure is passed by the Legislature, sent to the Mayor for his approval and if he approves it, it then goes to the Governor for his approval or disapproval.

5—The Board of Aldermen; An established right or rule of a city; The Aldermen may direct the sweeping of sidewalks during certain hours.

## CHAPTER VI.

### THE ELIGIBLE LIST

After the mental examination the applicant must wait until the list of eligibles for appointment is compiled. It requires some time (according to the number of those examined) for this work to be accomplished by the examiners. Each paper is gone over separately and rated. When the eligible list is ready it is published in THE CHIEF in the order of the standing and percentage of the candidates.

#### Certification.

When the eligible list is ready the Fire Commissioner sends to the Civil Service Commission what is termed a requisition for names to fill so many vacancies. If there is one vacancy to be filled three names are sent; for two vacancies four names; for three vacancies five names, and so on. Under the law the appointing commissioner must be allowed extra names from which to select. The number of names certified depends upon the number of vacancies to be filled. To find out exactly how many names would be certified to fill a given number of vacancies, divide

the number of vacancies by 3 and multiply the product by 5. Thus, for 30 vacancies 50 names would be certified.

#### **Appointment.**

Having received the list of eligibles the Fire Commissioner makes appointments from the same according to the number of vacancies. The Commissioner seldom exercises the legal right of rejection except for cause. Notice is sent to each fortunate applicant to appear at Headquarters for appointment on probation.

#### **Second Medical Examination.**

When appointed on probation each applicant is put through a medical examination before the medical officers of the Fire Department, who certify to his physical soundness. Between their first and second medical examinations applicants cannot be too careful of their general health. While the Fire Department examination is not quite so severe as the first, applicants who have passed the Civil Service examination have been known to be rejected by the medical officers.

#### **Assignment To Duty.**

When an applicant is appointed a fireman on probation he is assigned to a company. Tall men are usually

sent to hook and ladder companies, the others to engine companies. The applicant goes to a fire house, sleeps there, and does fire duty the same as the regular firemen, except that he does not wear the uniform.

### Instruction.

The probationary period for a fireman is three months. The new fireman spends his nights in a fire house and his days in the School of Instruction in the drill yard at Fire Headquarters. Every day he is ordered to report to the Chief Instructor. Before being permitted to don a uniform he must be regularly graduated from the school.

When the young fireman enters the school, he is only a raw recruit. When he leaves it he knows all that the most experienced of firemen can teach him. Just like in any other school, the lessons begin with the a b c of fire fighting. The young fireman sees the scaling ladder on which rescues are made. He is taught how this implement is fastened in windows and the way to climb it. Usually a net is out so as to catch him should he make a false move.

In the school is taught the art of saving life at fires with the least possible risk to the fireman. The pupils rapidly acquire this knowledge and soon are able to

build a chain of scaling ladders from the ground to the roof.

Jumping into the life net and holding it are taught. The right way to jump into a life net and the right way to hold it are matters of the greatest importance. The student is taught the value of self-confidence, and what once seemed a very difficult and dangerous act is readily performed and with ease.

The proper way to handle the various tools and implements carried on the apparatus of the department is shown, and a candidate if proficient at the end of his probationary period, becomes a member of the Life Saving Corps, and is sworn in by the Commissioner as a regular fireman.

#### Pay of a Fireman.

A new fireman on entering the Fire Department receives \$1,000 for the first year, \$1,000 the second year, \$1,200 the third year, and the maximum, \$1,400, the fourth year. In three years he becomes a first-grade man, and is eligible for promotion to engineer at \$1,600, and to assistant foreman at \$2,100. At the end of twenty years he is entitled, on demand, to retirement on one-half his salary.

In 1911 the pay of newly appointed firemen was increased from \$800 to \$1,000 through the efforts of THE CHIEF, which appealed to the Board of Estimate and by facts and figures convinced that body of the justice of higher pay.

## CHAPTER VII.

### CIVIL SERVICE RULES.

The following rules of the Municipal Civil Service Commission relative to the appointment of patrolmen and firemen contain information important to all applicants.

No applicant for the position of fireman or policeman who receives on the mental examination an average of less than 70 per cent., and on the physical qualifications less than 70 per cent., shall be placed upon the eligible list.

No applicant receiving 0 in any one subject shall be placed upon the eligible list.

When a candidate shall have been examined a circular letter, in the following form, shall be sent by the secretary to persons who have given recommendation upon his application paper, unless a satisfactory report of their answers shall have been made by the Examiner of Character.

### MUNICIPAL CIVIL SERVICE COMMISSION.

To ..... New York, ..... 190....

Sir: Appended to the application of.....

for a position in the Municipal Service as a.....  
is your general certificate of his (or her) good character and habits.

In addition to this, it is necessary before he (or she) can be appointed that satisfactory information regarding his (or her) character, habits and associates, be received directly from his (or her) certifiers.

I therefore respectfully request you to answer the following questions in writing, after each, to sign your name, give your occupation and address at the foot, and return the papers to me at your earliest convenience. Very respectfully yours,

.....,  
Secretary.

#### Certifier's Statement.

This sheet should be promptly returned, as a failure to return it will be regarded as a refusal to certify to the character or competence of the applicant.

1. How long have you known the applicant?
2. Has he ever been employed by you, and if so, when and how long?
  - (a) If he has ceased to work for you, why did he leave?
  - (b) What was the nature of the work done by him?

- (c) Was his work satisfactory?
  - (d) If not, in what respect was it deficient?
3. What is his present occupation? State upon whose information you answer.
  4. In what other occupations has he been employed? State upon whose information you answer.
  5. What is his character as to
    - (a) Honesty?
    - (b) Trustworthiness?
    - (c) Habits as to the use of intoxicants?
  6. Other things being satisfactory, would you, with your knowledge of his capacity, condition of health, character, associates and habits, employ him in your own private business, had you occasion for such services as he desires to render the City?
  7. Are you willing to allow your answers to the foregoing to be published?

Name .....

Occupation .....

Address .....

No persons concerning whom recommendations are required shall be appointed to any position for which an examination is necessary, unless satisfactory answers are returned to these questions by at least two of the persons who have given such recommendations, or unless a satisfactory report of their answers shall have been made by the Character Examiner.

**Appeals-Revision.**

Complaints of injustice or unfairness on the part of any examiner or Examining Board, or of any one acting under the Municipal Commission, shall be considered by such Municipal Commission, which shall have the right to revise the marking and grading on the papers, or order a new examination, or otherwise act as substantial justice as the premises may require.

Upon each eligible list shall be placed the names of only such persons as have been found by the Examining Board to be duly qualified for the position for which such list is prepared. The names of candidates shall be placed upon such list in the order shown by the respective percentages of their aggregate markings upon their examinations.

When two or more eligibles on a register have the same average percentage, preference in certification shall be determined by the order in which their applications were filed, but neither priority in the date of application nor of examination shall give any other advantage in position on the registers of eligibles.

In examinations for promotion, when two or more eligibles on a register have the same average percentage, preference in certification shall be determined by seniority in service.

The term of an eligible list is fixed at not less than one year or more than four years from the date of the establishment of such list. An eligible list which has been in force for a period of one year shall terminate, provided that a new examination has been held and a new list prepared for the same position. Persons whose names appear upon any such eligible list shall be notified by mail when a new examination is to be held for the same position, and informed that their eligibility will cease upon the establishment of the new eligible list as the result of the new examination.

Whenever an eligible certified for appointment shall fail to accept an offer of appointment sent to him by mail at his post office address within four business days next succeeding the mailing of such offer of appointment, he shall be deemed to have declined such appointment.

If the appointment shall be made of any person other than one of the three standing highest on the eligible list, the appointing officer shall forward to the Commission, with the notice of appointment, copies of all correspondence to and from the persons declining such appointment.

No person on an eligible list shall be certified more than three times to the same appointing officer for the same bureau or institution, except at the request

of said appointing officer, unless the person so certified is a veteran, in which case his name shall continue to be certified so long as it remains on the eligible list under these rules.

No candidate shall be granted a second or special examination or any second or special trial or test, either written or physical, preliminary to, or in connection with any examination held hereunder, unless it be shown to the satisfaction of the Commission that his failure to appear for, or to gain admission to, or to complete such examination or test, was due to a manifest error or mistake for which the Commission is responsible, the nature of which shall be set forth in its minutes, or that such failure was due to compulsory attendance before any Court or other public authority having the power to compel such attendance.

The Secretary, as early as practicable after the completion of an examination, shall notify each candidate therein of the rating he has received, and, if such rating be above the required minimum of his comparative standing. He shall likewise notify each candidate, who though admitted to the examination, has been rejected for reasons other than failure to receive the required minimum, stating such reasons specifically. Any candidate receiving any such notice may personally inspect his examination papers, if any, at

any time during the office hours of the Commission, and in the presence of such officer or employee as the Commission from time to time may designate.

No examination paper or any part thereof, and no record of the results of a physical test, or any other record or statement rated as part of an examination, or in connection therewith, shall be subject to review, alteration or re-reading after the marks of the examiners have been registered or attested as required hereunder, except that the Commission at any time within a year from the date of the certification of the examination may correct any manifest error or mistake or marking or rating appearing in any such paper or record, the nature of which shall be set forth in its minutes, such correction, in any case, to be without prejudice to the status of any person previously appointed as a result of such examination.

## CHAPTER VIII.

### INSTRUCTIONS ON FIRST AID TO THE INJURED

#### Burns and Scalds.

Treatment—Cut pieces of lint or clean linen, absorbent cotton or muslin into strips and soak them in a solution of picric acid, 30 grains or about a half a teaspoonful, to a pint of water, or in a strong solution of bicarbonate of soda, or a mixture of equal parts olive oil or linseed oil and lime water (known as Carron oil), and apply the strips to the burn or scald. Picric acid solution is the best treatment and should be used when possible.

Cover this dressing with absorbent cotton or lint, and retain all with a bandage, firmly but not tightly applied.

Caution.—The severity of the injury frequently causes the clothes, such as stocking or underclothing, to adhere to the skin. NEVER DRAG THESE OFF. Cut around the part that is adherent, and soak the adhering clothing with any of the above solutions until it may be removed without damaging the skin.

### Broken Bones.

Symptoms—(a) Limb helpless; (b) pain and swelling at the point of injury; (c) shape and position of limb often unnatural; (d) if limb is gently moved into its natural position, a movement may be felt in the length of the bone as if it were a new joint. When a bone is broken there is always a certain amount of shock. Treat fracture with a flesh wound as follows:

1. Cut off clothing around the wound.
2. Take the greatest care to prevent broken ends of bone lacerating the flesh or wounding a blood vessel.
3. After treating wound, treat fracture.

Treatment, Fracture of the Thigh.—If the limb is not very gently handled the ends of the bone will injure the flesh, and perhaps even be sent through the flesh; therefore, slip one hand between the limb and the ground, with the other hand grasp the limb some distance in front of the fracture, and gently lift the extremity into its natural position without displacing the broken ends of the bone.

The best splints or supports in emergencies are narrow thin boards, but as these are not always available, an ordinary pillow or a small blanket folded, umbrellas, walking sticks, broomsticks, laths, either

singly or two or more tied together, a piece of wooden box, or one or more policemen's clubs tied together may be used. When applying, tie one of the emergency splints firmly, but not too firmly, to each side of the limb by means of handkerchiefs, straps, ropes, flannel or other bandages.

**Caution.**—Do not apply any bandage over the painful spot, but apply one above and below the seat of fracture. Now tie both legs together at the feet and at the knee.

When the thigh is broken one support must extend as one solid piece from the foot to armpit, and should be fixed by the bandages firmly to the chest as well as to the limb.

When the leg below the knee is broken the supports should extend from the heel to the middle of the thigh.

If no pillow splints, blankets or other supports can be obtained, tie both legs together at the thighs, knees and feet.

**Removal.**—The patient must be moved lying at full length on a gate, shutter, door or stretcher.

**Treatment, Broken Arm.**—Do not remove any of the clothing. If the fracture is above the elbow, two or more splints or supports must be applied to the arm. In order that the elbow may be bent and put in a sling the splints should not reach below the elbow.

Tie these supports tightly, but not too firmly together by bandages, handkerchiefs, neckties, etc., one above the seat of the fracture and one below. The arm should then be put into a small folded arm sling.

In treating fractures of arm below elbow use same supports and treatment as above, but applied below the elbow.

### **Drowning.**

Treatment.—Send for blankets and warm clothing. Turn patient on his face. Waste no time by asking how long he has been in the water.

Remember the patient is dying for want of air in the lungs. Lose no time, but get the tongue forward, water out and air in. Put your finger well to the back of the throat and clean out mud, weeds, etc., if any.

Clasp your hands around his waist, raise his middle, keep it elevated a few seconds to allow all water to drain out of his throat and lungs.

Turn him on his back.

The patient is unconscious and does not (because he cannot) breathe.

We must breathe for him by performing Artificial Respiration.

### Artificial Respiration.

1. Pull the tongue forward by grasping it with a dry cloth. It should be held out by a bystander if possible. It is generally necessary to keep the tongue forward, because in the unconscious state the root of the tongue is apt to fall back and block the passage of air into the lungs.
2. Raise the shoulders and put a pad of his clothing beneath them.
3. Kneel on both knees about six inches from his head, catch hold of the patient's arms, immediately below the elbows, press them firmly against the sides and front of his chest.
4. Slowly and steadily pull the arms up over the head, making the elbows almost touch the ground. The effect of this is to pull upon the chest walls on each side to expand the lungs and allow the air to rush in.
5. Follow continuously instructions No. 3 and 4 at about the rate of 16 times a minute.
6. When a patient begins to breathe, rub the legs and arms vigorously from below upwards, to assist the blood in circulation.
7. Remove wet clothing and apply dry clothing.
8. Give stimulants when conscious.

Caution.—Don't give up too soon, as vigorous and persistent treatment as above indicated has often resuscitated drowned persons for whose recovery all hope had been abandoned.

### Poisoned by Gases.

This may occur from—

Illuminating gas, escape of coal gas, the choke damp of mines, the fumes of a coke or charcoal fire in a badly ventilated room, foul gas of sewers, stagnant air at bottom of wells.

Caution.—Take no light into the room or other confined place where gases are.

If illuminating gas is in a room, turn off the gas and open or break the windows.

Remove patient at once to fresh air.

Loosen all the clothing around the neck and chest, but keep body warm.

If breathing has ceased, do artificial respiration as hereinbefore mentioned.

### Bleeding.

Treatment.—The first thing to do in the treatment of a wound is to remove all dust and dirt with absorbent cotton. Next apply a sterile gauze sponge to

the wound. The blood washes the wound. A clot immediately forms, which is Nature's remedy.

Bandage firmly.

#### **Venous Bleeding or Burst Varicose Vein.**

Symptoms.—Blood is dark purple; wells up from wound and does not come as a jet.

#### **Treatment.**

1. Lay the patient down.
2. Elevate the limbs.
3. Loosen garters, etc., around legs.
4. Apply a sterile gauze, lint or cotton.
5. Bandage firmly.

Attempt at once to stop the bleeding by putting a sterile gauze, lint or cotton into the wound, and immediately apply pressure over the pad. Should the bleeding still continue, or if the limb is shattered, then apply a tourniquet, and use only sufficient pressure to stop the bleeding. A tourniquet is made with a rope, handkerchief or necktie, etc., tied in a loose loop around the limb, and a stick or a club put through, and then turned around until sufficiently tight.

CHAPTER IX.

**INSTRUCTIONS FOR APPLICANTS**

**BY ERNEST L. CRANDALL,**

**Former Examiner of the Municipal Civil Service  
Commission.**

**FIRST LESSON.**

The conditions in and requirements for the service of the Police and Fire Departments of the city are so similar that we shall, as far as possible, treat of them together.

Both offer excellent opportunities for men of good physique and average intelligence, with no requirements of special training.

Both departments are making very determined efforts to extend their service, and it is a question of only a little time before they must succeed.

These departments, of all others, must grow with the city's growth. It is safe to say there will be a larger demand for firemen and patrolmen within the next year than has ever before been known.

Examinations for these positions are held about once a year, according to the exigencies of the service and at the discretion of the Civil Service Commission.

The time to prepare for such examinations is now, not just a few days or a few weeks before the examination.

The pay of a New York patrolman on entering the service is \$800 per annum. The second year he gets \$900, the third \$1,000, the fourth \$1,150 and first half of the fifth year at the rate of \$1,250, and the second half at the rate of \$1,350, and thereafter \$1,400. From the end of the fifth year he is known as a "first grade" man and is eligible for promotion to the rank of sergeant, formerly known as roundsman, at \$1,750 per annum.

The pay of a New York fireman upon entering the service is \$1,000 per year, second year \$1,000, third year \$1,200, and the fourth year \$1,400, which is the maximum.

From the end of the third year a fireman is a "first grade" man. From that time on he is eligible for promotion to engineer, at \$1,600, or to assistant foreman, at \$2,100.

There would seem to be a pretty attractive range of salaries in both departments for the man of only *average intelligence*, and with no special training.

The first consideration is age. You must be more than twenty-one and not more than twenty-nine years of age at the time of applying.

Naturally there have been many attempts to evade this.

At one time it was found that some one here in New York was turning out beautifully engraved, bogus baptismal certificates purporting to come from some obscure town in Ireland.

But to try to get around this provision is not only wrong, but dangerous. Don't try!

The next question is your height.

You must stand 5 feet 8 inches in your bare feet, to become a fireman, and 5 feet 8 inches to become a patrolman.

These measurements are exact, taken by means of a sliding weight pressed down upon the head. So it will not do to be nearly up to requirements. You must "measure up."

If, however, you find on first taking your height you lack but little, you need not wholly despair. There are ways of "adding to one's stature," within reasonable limits, in most cases.

If your occupation has required you to stoop, to do a great deal of lifting, to sit—probably in a stooped position—most of the time, your spine has probably bent and settled, until you lack quite a little of your

full possible height. Indeed, most of us, unless we watch ourselves, are habitually far less erect than we might be, and therein lies the secret of carrying one's full height. Any army man could tell you this.

To gain your full height and know just how much you can measure up, follow carefully the following suggestions:

Cultivate the habit of walking, standing and sitting in as erect a position as possible, head and shoulders well back and with a consciousness of trying to carry your full height.

When you go to bed, stretch yourself full length. Avoid above all things the habit of curling up, or drawing up the knees, in bed.

Sleep on a hard bed, with a very small pillow.

There are also special exercises, which are helpful.

All bar practices, in which the body is suspended, and which develop the muscles of the back and torso, are excellent. If these are not available, practice calisthenics which brings the arm above the head and develops the back muscles.

The simplest and one of the most effective is one of those known in the United States Army as "setting up" exercises.

Stand with heels together, hands above head as high as you can reach, bend swiftly forward, touching the

toes or the floor with the fingers (if you can). Keep the legs rigid all the time.

Rise to the starting position. Drop arms, straight to level of shoulders, well back, then to sides. Fingers to floor again. Rise to starting position and repeat until you feel limbered. Never go to the point of fatigue.

Another good exercise is to lie on the back on the floor, brace feet against baseboard, extend the spine and neck along the floor just as far as it is possible to push them. Rise to sitting posture and return to lying position without use of hands. Repeat a number of times, each time consciously endeavoring to measure as much of your length as possible on the floor. It is surprising how this will straighten the spine.

A great deal of fresh air, frequent bathing and sensible diet are all very essential in order to keep the muscular system in tone.

The secret lies there, to train the proper muscles into the habit of holding every inch of your body erect and up to its full height.

Do not fancy if you are five feet six that this sort of thing will add the needed inch.

I have heard a man claim that he had "added" more than a half inch to his height. How much of that may have been due to inaccuracies of measurement

or imagination I cannot say. But I know personally of a case where under the most careful measurements a gain of a full three-eighths of an inch seemed to have been effected.

So if you are not "shy" over a quarter inch it is worth while to "try it on."

### SECOND LESSON.

In addition to being of a prescribed height, every candidate must meet certain requirements, not only as regards muscular development, but as regards general physical condition. These are ascertained by tests, constituting what is known as the medical and physical examination.

The importance of this physical examination is shown by the fact that of 2,836 candidates for patrolman examined in one year, exactly 1,338 were rejected on physical examination.

For admission to the Police Department this test counts 50 and the mental test 50, on a scale of 100; and a rating of at least 70 per cent. must be obtained in each. The Fire Department, however, complained so much of the low standard of physique of the men obtained, that this rule was modified for that department; so that a candidate who gets over 80 per cent. on the physical and a final average of 75 on the two combined is eligible.

That means that for every one per cent. he can add to his physical rating, he has one to spare on the mental test. If he can make 90 on the physical, he will require but 60 on the mental.

This makes the fire service the more attractive of the two to those who are at all afraid of the mental test.

In the last examination this provision seemed to have no practical effect in the direction of securing better men physically. That is, the men who were below 70 on the mental end, who got on the list by reason of this provision were not above the average, physically, of the best men on the list.

Here are the actual requirements as set forth by the Civil Service Commission:

1. Before admission to an examination for the police or fire service, each applicant therefor, whose application has been accepted, shall be subjected to medical and physical tests having reference to (a) measurements of weight, height and chest expansion and mobility; (b) sight and hearing; (c) habits as to the use of stimulants and narcotics; (d) general organic condition, and (e) previous condition of health. The medical and physical examiners shall report to the Commission in writing the results of such tests, and no applicant shall be admitted to the

examination who is not certified by them to be qualified and sound in each of the aforesaid particulars.

2. The minimum relative measurements required shall be as follows:

Expan. ins.	Mob. ins.	Height ft. ins.	Weight lbs.
36½ in. ....	3 in. ....	5 ft. 8 in. ....	140 lbs.
37 in. ....	3½ in. ....	5 ft. 9 in. ....	145 lbs.
37 in. ....	3½ in. ....	5 ft. 10 in. ....	150 lbs.
37½ in. ....	3½ in. ....	5 ft. 11 in. ....	155 lbs.
37½ in. ....	4 in. ....	6 ft. 0 in. ....	160 lbs.
38 in. ....	4 in. ....	6 ft. 1 in. ....	165 lbs.
38 in. ....	4 in. ....	6 ft. 2 in. ....	170 lbs.
38 in. ....	4 in. ....	6 ft. 3 in. ....	175 lbs.
38 in. ....	4½ in. ....	6 ft. 4 in. ....	180 lbs.
38 in. ....	4½ in. ....	6 ft. 5 in. ....	185 lbs.

Taking a typical case, these provisions mean first, this:

If your height is 5 feet 8 in., your weight must not be above or below 140 pounds.

By "expansion" is meant your normal, stripped chest measurement, at repose.

By "mobility" the extent to which you will stretch the measuring tape on taking a deep breath.

So far as the chest development is concerned, if you are below par in that respect it is easily corrected.

As for exercises, those without weights, bells or any apparatus are as effective as any. All the straight arm movements are good.

This one is particularly recommended: Starting with the palms together high above the head, separate the hands and bring them down vigorously, but not brusquely before the body in a continuous curve that will carry them behind the small of the back, until they come as near touching as possible. Each time you repeat, start with the hands three or four inches lower than the preceding time. Practice this as many times a day as possible, ten or fifteen minutes at a time.

A very large percentage of candidates are rejected for excess or deficiency in the matter of weight. As this is something that cannot be corrected hurriedly, it is well to give your attention to it long in advance.

For either condition, the first consideration should be given to the general habits. Plenty of fresh air, sufficient sleep, regular hours, moderation in the matter of food and drink, freedom from narcotics or alcoholic stimulants—all these will tend to restore a man to the normal state, whatever his condition; and at normal you are likely to tip the scales about right.

There are some special precautions for both cases, however. The advice here given is that of a compe-

tent physician, with years of experience in this sort of thing.

To reduce weight, first comes diet: Eliminate as far as possible all those foods which contain sugars and starches. That includes all sweets and pastries.

Normally, one must have sugar in some form. For this training, however, it can be almost wholly omitted, with safety. If taken at all, let it be moderately in one's beverages, or in the shape of a little sweetened fruit. Eschew pastry altogether. The starchy foods to be avoided embrace bread, cereals, potatoes, beans, corn and other farinaceous vegetables.

Avoid cereals. Limit yourself to one slice of bread (dry) at each meal. Use potatoes very sparingly, and cut out the other vegetables mentioned altogether.

Be very sparing in the use of milk, cream or butter. You will find, after a little, that quite a variety remains. Especially in the Spring season green vegetables are beneficial.

In addition to avoiding milk, all malt or spirituous liquids must be absolutely tabooed. And of the first importance is to drink no water during meals. This cannot be too strongly emphasized. A very small quantity of weak tea or coffee may be taken during meals, but the amount of liquid taken into the system is to be kept down to a minimum at all times.

As for exercise, all those movements which develop the abdominal or torsal muscles are good—bending, swaying, twisting in every conceivable form, with feet together and legs rigid; also waist and leg exercises of any sort practised while lying on the back. But the prime factor as to exercise in reducing weight is walking—in the open air. Each must suit his own strength. Manage to walk, though, at least from three to five miles per day.

Finally, keep the bowels open. Fresh fruits in moderation will help here. If not attainable otherwise, small doses of saline cathartic, such as mild salts or mineral waters, must be taken each morning till the desired results are obtained.

### THIRD LESSON.

The matter of gaining weight—and holding the gain, if below the prescribed requirement—is not so hopeful as the problem of reducing flesh. Thinness is generally constitutional or due to conditions in one's habits or employment that are often not controllable. However, a published report of the Civil Service Commission shows that out of 36 candidates who were allowed a second examination, after rejection for light weight, 17 passed and 19 failed on the second examination. Therefore there is some hope.

To add to your weight in a manner that will be of permanent benefit, first take plenty of sweets, but in more reasonable forms, sweetened, dried or fresh fruits, sugar on cereals and in tea or coffee and candy itself in moderation.

Candy is now a part of the United States soldier's diet. The plainer kinds only are beneficial. Sweetened chocolates are excellent.

Neither must you adopt the habit of drinking water with your meals or of partaking too freely of liquids at any time. Both practices tend to derangement of the digestive system.

For the same reason all forms of alcoholic beverages are to be avoided.

Right here, we may say, if you are not a total abstainer, you had better become one if you are looking to enter either the fire or police department. It is that type they are looking for.

Again, in gaining weight, you are not to suppose that fat meat is in itself fattening; take your meat, in moderate quantities, just as it comes, fat and lean. Do not make the mistake either of fancying that eating a great deal will help. A little food well digested goes further than a mass of ill-digested rubbish.

Favor vegetables, breadstuffs and cereals. Eat plenty of butter and let your principal beverage be milk. Give eggs, raw, or boiled not over one min-

ute, the preference over meat, but not, of course, to the extent of tiring the appetite for a general variety of food.

Eat slowly and chew your food thoroughly. Drink very slowly, also. These two things are very essential.

Finally, it is absolutely imperative to have abundant sleep. You cannot get too much of it, with regular hours.

Also plenty of fresh air is essential.

If your tendency is to light weight and you have the required height, you will do well to select the police rather than the fire service. This cannot be too strongly emphasized.

As to the actual physical tests of strength, you will have to undergo, it is needless to describe them in detail. They include:

Standing high jump—60 per cent. being given for 3 feet 6 inches and 100 per cent. for 4 feet 1 inch.

Chinning and dipping, twenty consecutive times, of both combined, giving a maximum of 100 per cent. That is, you may chin 10 consecutive times and dip 10, or you may chin 12 and dip 8, etc.

If a gymnasium is not available, dipping may be practiced at home on two chair backs. I have known men to practice the chinning exercise at home also, utilizing the door jam. It is a little hard on the fingers.

The candidate is called on to put a 60-pound weight up at arm's length over his head with one hand. Allowance is made for attempt if unsuccessful.

Another very severe test is lying on the back, the neck resting on a cross-bar connecting two weights which aggregate 35 pounds, grasping this bar with the hands, and rising with it to a sitting posture. Allowance is also made here, as throughout, for attempt.

The candidate is also expected to ascend and descend a ladder, hand over hand.

There is also a back lift—to raise a 450 pound weight from the floor with both hands, legs rigid; a back lift, to raise a 290 pound weight from the floor, back erect, the lifting being done by the legs between which the weight is stationed.

Special apparatus is provided to test the pectoral push muscles, squeezing an object between the hands in front of the breast; fraction pull, with arms in same position; adductor squeeze, pressing an object between the knees.

If the candidate cannot have access to apparatus, let him consider what muscles are involved in all these exercises, and train those muscles carefully without any apparatus.

If you put your mind intently upon the use of the muscles sought to develop, and go very deliberately through the required motions, you will be surprised

to see what strength you will gain. A celebrated and successful system of physical culture depends on this principle alone.

Test your eyesight by street signs, etc., one eye at a time.

A good test of hearing is to locate a watch by its ticking, the eyes being closed.

If you are in doubt about either consult a physician.

Hernia (rupture) or varicose veins must reject, unless in such an incipient stage that an actual cure can be effected before you go up for examination. Only a physician can advise you here.

Finally, if you have not perfect teeth, see a dentist at once. This is a most fruitful source of rejection. The point is that a man requires good teeth as an aid to digestion, and digestion is health. The medical examiners will not waive a point here.

A man must have twenty natural teeth, including on either side two sound molars in position to do effective work. For other defects only bridge work is accepted, except in rare cases. Tell your dentist these facts.

#### FOURTH LESSON.

Having fully considered the physical requirements, we will now take up the mental tests applied to candidates for fireman or patrolman.

The subjects are the same for each, though the character of the questions asked may vary slightly as between the two departments, as we shall see later.

Candidates are examined together, usually several hundred at a time. This is accomplished by hiring some large hall, like Grand Central Palace, in which folding chairs and tables are installed, the candidate furnishing his own pen and ink. Men have lost their chance by forgetting the latter provision.

The candidates' papers are numbered in such a way that it is impossible for the examiners who rate them to discover a candidate's identity, thus insuring absolute fairness.

The subjects of examination, with their respective weight, are as follows:

Elementary knowledge of government.....	3
Localities (by boroughs).....	3
Memory test .....	2
Arithmetic .....	2

By the "weight" of a subject is meant this: You will see that these "weights" aggregate 10. The process followed is to multiply the mark which you obtain in each subject (on a scale of 100) by the number opposite, add all four results thus obtained and divide by 10 to get your general average, which must equal 70 per cent. with the exceptions made

for the Fire Department, as shown in a previous article.

Thus a candidate may fall below 70 per cent. in one or more subjects and yet pass the examination.

To illustrate, suppose you get 75 per cent. on your government paper, 80 per cent. on localities, but only 65 per cent. in memory test and 60 per cent. in arithmetic. Your mark will be three times 75 (225) plus three times 80 (240), plus twice 65 (130), plus twice 60 (120), or 715 altogether, divided by 10, which will give you a general average or rating of 71.5 per cent., although you have failed in two subjects.

The fractions of a per cent. are counted, and there will often be ten to twenty candidates between 71 and 72, for instance. With candidates of exactly equal rating, priority in the filing of application gives preference.

There was formerly a test in spelling, which has been abolished. Also the candidate's handwriting was marked on a paper relating to applicant's previous experience. The experience paper has been eliminated very recently, because, as stated by the commission, whatever a man's previous experience, he has to learn the business, like any other, after he gets "on the job."

In consequence, handwriting is no longer rated specifically. But we mention this because both spell-

ing and handwriting are still of importance. Whatever your paper is about, or however accurate your answers, it is almost a moral impossibility for an examiner to look as favorably upon a paper badly spelled and illegibly scrawled as upon a neat, well worded, correctly spelled paper. This especially in view of the fact that you are a candidate for a position where you will constantly have to make entries and reports, at least of a simple character. Defects along these lines are not fatal—but, if you are rusty, brush up. It will pay.

Of the actual papers given we will discuss the simplest first.

The memory test is given as follows:

All candidates are required to stand at "attention." This is so that none may write surreptitiously till the test is finished. Some one in charge of the examination then reads in a loud, distinct manner a short paragraph. This is generally of a character similar to the instructions read by a police captain on turning his men out on patrol, or the instructions of a foreman to a fireman. As soon as the reading is finished, you are to sit and write out verbatim what you have heard. Deduction will be made from the maximum of 100 per cent. for any omission or change in the original.

Here is a passage actually used: "It has been reported that the pavement on Madison Avenue, between Forty-first and Forty-second Streets, has been torn up, so that an engine could not safely pass through. Go there, ascertain the facts and bring back an exact report of them."

Here is another passage based on an actual police description of a fugitive from justice: "Look for Charles Webster, wanted for burglary. He is twenty-two years of age, is five feet nine inches in height, weighs 133 pounds and of medium build. He has brown hair, blue eyes, medium dark complexion, and no moustache. Has a scar on the palm of right hand. Was born in the United States and is an ironworker by trade."

Both these passages are short and simple, yet it is surprising how many errors and omissions even a pretty well trained mind might make in the effort to transcribe them. Practice alone will make perfect in this sort of thing. Get some friend or member of your family to read you passages about this length from the newspapers, or better still, to invent similar tests; write these down from memory, then compare and carefully note your errors. By a little practice any one should become sufficiently apt in this exercise to get 100 per cent. on these tests. As this

means a full 20 out of the 70 per cent. required, it is clearly worth while.

Another very essential point in the practising, as well as at the time of the actual test, is to pay the very strictest attention to the meaning of the passage, get the gist of it. Note carefully the precise thing to be done or attended to, rather than letting your mind dwell on the words. Candidates frequently jumble together what has been to them a mere string of meaningless words, with results that are sometimes ludicrous.

I recall one description which turned out a cross-eyed suspect arrayed in a "brown shirt and pink pants." No wonder he was a "suspicious person." But if you will practise with the principle in mind which we have stated, the habit of recalling the wording accurately will come of itself. Remember, it is a possible 20 per cent.

#### FIFTH LESSON.

As we have seen, one of the papers in the examinations for the position of fireman or policeman is a paper on Government. The subject as thus stated is very broad, and purposely so. It is intended to hold the candidate to a reasonable knowledge of the forms and functions of National, State and Municipal government.

The selection of subjects for these examinations is the result of years of experimenting. We have mentioned three subjects that have been eliminated, experience, handwriting and spelling. Another subject has also disappeared, which at one time made up a great part of the examination, namely, the paper on the rules and regulations of the two departments, respectively.

It is now left to the departments themselves to instruct the men in the knowledge of the rules during their probationary period. As a result we have a most rational selection of subjects—a memory test to ascertain if a candidate's mind is capable of grasping and holding instructions from his superiors, an arithmetic paper to ascertain if he has received at least a minimum of schooling and is not wholly unlettered, a localities paper to ascertain if he knows his way about, and a Government paper to ascertain if he has some conception of the character of that Government of which he seeks to become a public servant.

Than this last, no more proper inquiry could be conceived.

It is not expected that a candidate should show himself a lawyer or statesman. The lines of the examination are broad and general, and indeed such as to demonstrate practically nothing more or less than whether the candidate is a fairly well informed citizen.

None of us can know too much about the government under which we live. Most of us have far too hazy a notion of its workings.

The subject of Government forms a part of the examinations for many positions besides those of policeman and fireman, both in the City service and in the State service. There was recently an examination for Court Attendant in the State service, in which this subject played an important part.

Now, just a word as to how to study these lessons, when you come to write your paper. You will want to make your answers as full as you can, getting in all the information that is really responsive to the questions; but what you want for that purpose is knowledge of the subject, not words. So, do not learn verbatim any of the material given here, but seek rather to get a thorough and well digested comprehension of all the information given.

In this way you will escape becoming confused by the particular form which the questions may take, which can, of course, never be foreseen and which, in fairness, the persons preparing the examination must cause to vary all they possibly can. To illustrate this, we will take the first question we propose to answer and show how it may be varied. We shall start with the State Government.

Q. Into what three branches is the State Government divided and what are the general functions of each?

A. Legislative, executive and judicial. To make the laws, to enforce the laws, to interpret the laws.

This is the briefest possible answer, hardly sufficient, and we shall expand upon it somewhat. But we will let it stand for the present, just to show how many forms just this one question might appear in. For example:

Q. Who makes the laws of the State of New York and how are they carried into effect?

Q. What are the functions of the executive branch of the State Government and how is it related to the other branches?

Q. To what branch of the State Government do judges belong and what is the function of that branch?

Q. How are the laws of the State of New York made and enforced?

Q. State in a general way how our State Government is administered.

Q. State what is meant by the executive branch of the State Government and how it is related to other branches.

And, indeed, the same information, or part of it, might be elicited by questions stated in numerous other forms. So what you want to get are the facts,

and then the form of the question will not disturb you.

Now to return to our question in its original form:

Q. Into what three branches is the State Government divided and what are the general functions of each?

Now, that word "functions" has puzzled many a poor candidate whose limited education was acquired before this evolutionary, biological, antiseptic era of ours, when everything is expressed in terms of the organic. The term is one borrowed from biology, or natural history, and it refers to the work that is performed by any given part of an organism or living thing. Thus the function of your eye is to see. The function of your stomach is to help digest your food. Your liver also plays a part in this, secreting bile, and if you are bilious your doctor will say that your liver does not functionate properly, which sounds better than saying it does not work well.

So government is looked upon as a sort of social organism, and the work that any particular branch or body has to perform, the part it has to play in the general scheme, is called its function. We have paid our respects to this very respectable word, because our Civil Service friends are rather fond of it, and it is constantly cropping up in all sorts of examinations. Let us extend our answer a little.

Answer—The three principal branches of the State Government are (a) the Legislature, consisting of the Senate and Assembly, called collectively the Legislature. The functions of this branch are to make laws in accordance with the Constitution of the United States, and of the State of New York; for the administration of public justice, which includes the definition and punishment of crime, the creation and abolishment of courts and judicial officers, and in a general way the establishment and enforcement of machinery for the enforcement of the criminal law, such as defining the powers of sheriffs, policemen, constables and other peace officers, for the regulation of trade and social and domestic relations between citizens, which includes the creation and control of corporations, as well as the making of laws defining fraud in business relations, regulating traffic, establishing weights and measures, controlling conditions of employment, etc., the creation and abolishment of courts for the enforcement, also of private rights and the correction of private grievances; the enactment of laws looking to the public health and safety, and providing for the education of the young; the training or legislation regulating the administration, within the limits of the Constitution, of all branches of the State Government, with the power to levy taxes and make appropriations to meet the expense of such administration.

Quite a formidable array of "functions"—and yet it only scratches the surface. A very important topic, even for a rudimentary knowledge of government, is the laws that the Legislature cannot make. But that must be deferred to another lesson, as must also the consideration of the other two main branches of government.

The point here is—Your question might require you to state what subjects the Legislature controls, for instance, or what is its relation to the administration of public justice, or by what authority taxes are imposed.

Study all answers, therefore, with a view to their bearing on any possible question. It will not be necessary to repeat this advice. Do not read merely. Study!

## SIXTH LESSON.

We will resume our discussion of the answer to the question calling for the three branches of the State government, with their functions. Under heading marked A, we consider the functions of the legislative branch.

(B) The second main branch of the State government is known as the executive branch. It includes the Governor, who is known as the Chief Executive of the State, as well as the heads of the various State

departments, such as the Insurance Department, the Banking Department, the State Health Department; the heads of which are known sometimes as commissions or commissioners, sometimes as superintendents, together with all their subordinates and employees.

The functions of this branch of the State government are not merely to enforce the Constitution and the laws, the full responsibility for which does not rest upon this branch, but also to administer all the business transacted by the State as such. This it does through the various departments named and numerous other departments and bodies; hence these departments are often referred to as administrative departments. Thus the question might be asked, what are the administrative departments of the State government, etc.? We shall describe them more fully later on. It is enough here to give as above, a general idea of what they are.

Another distinction is important here. In the enforcement of the laws, both criminal and civil, the executive branch of the State government has the help of purely local officers, District Attorneys and Sheriffs, for instance, and, in cities, the Mayor and the Police Department, whose duty it becomes to enforce general State laws, as well as local regulations. All these are made in some measure amenable to State and County, and most of them are removable by the

Governor, the chief executive. But the spirit of our laws is such that all the affairs that concern only the people of a given locality or community are regulated and controlled so far as possible by the people of that community. This is what is frequently referred to as the principle of "home rule." So it comes about, for instance, that here on Manhattan Island we are looked after by four distinct sets of officials—belonging to as many different systems of government, National, State, Independent and County, all in large measure independent of one another. Care must be taken in forming your ideas of the way in which we are governed to keep these various systems distinct in your mind.

Thus it will be seen that in gaining a thorough idea of the meaning of one question you really equip yourself with material to answer several. For example, you might be asked:

How many systems of government have we in New York City?

What is meant by the principle of home rule?

What county officials assist the Governor in the enforcement of law, etc., etc.?

It is a good plan as you study your material to frame for yourself as many questions as you can to which the matter in hand furnishes an answer. You will thus acquire the habit of looking at the subjects

from every possible angle and will not be taken unawares, whatever form the questions assume. Naturally, we cannot continue to do this for you in future lessons, but we have illustrated the principle fully so that you might acquire the proper method of study. It is, in fact, the great secret of thoroughness in the study of any subject.

To return to our original question:

C—The third main branch of the State government is the judicial. It consists of the system of State courts, both civil and criminal, whether of original or appellate jurisdiction (that is, whether for the trial of cases or for the hearing of appeals), together with the judges, officers and employees of the same and the function of said courts is to interpret the law.

Two things are meant by the expression "interpret the law." One is to determine whether or not a given law (act of the Legislature) is constitutional, that is, whether it runs contrary to any of the general provisions of the Constitution, and is therefore void in whole or in part. The other is to determine in what manner the law, as it exists, applies to a given state of facts presented in court by means of evidence. This embraces the trials of all actions, civil or criminal. The principle is the same whether the People of the State of New York accuse John Doe of murder, or whether John Smith accuses John Brown of buying goods and

not paying for them. The function of the court is to determine whether the facts as established come within the laws of homicide, in the one case, and within the law of contracts, in the other.

As in the case of the executive branch, a distinction is to be noted between State courts, which embrace all those provided for in the Constitution, and inferior or local courts of petty jurisdiction—that is, jurisdiction over petty offenses, if criminal, or small amounts, if civil. The County courts, so called, are State courts in fact, because the counties are really only subdivisions of the State, and these courts are provided for in the Constitution.

However, these distinctions are of more interest to our friends the candidates for Court Attendants, and if you wish to know more about them you may read the lessons provided for them. They are mentioned now that you may keep well in mind the division of authority between State and local governments.

### SEVENTH LESSON.

In our last lesson we were considering the distribution of powers between the State government and its officials and those of the city. We saw how in both the executive and judicial branches the two sets of officials act quite independently of one another, yet they are in a measure related.

The Mayor of New York City, for instance, may govern the city just as he pleases, but if in so doing he is guilty of flagrant violation of duty it is within the Governor's power to remove him.

Again, a Municipal Court Judge may decide a case according to his own ideas of justice, but his decision can be appealed from to a court of record, or State court.

Thus we do not want to get the idea that "home rule" means that every locality shall run its own affairs absolutely; but we do want to bear in mind the general principles on which the activities of government are divided between State and municipality, viz., the State to control in all that affects the people of the State generally; the city or municipality to control in things that affect only the people of that community.

Now we shall find the same distinction applies to matters of legislation as well as in the executive and judicial. For instance, at a recent examination, a question like this was propounded:

"Q. What is the difference between a law and an ordinance? Illustrate."

A law is an act passed by the State Legislature at Albany and an ordinance is an enactment of the Board of Aldermen, which is the legislative branch of our local government. A similar power of making ordi-

nances or like regulations is, of course, vested in every other city or municipality. Such regulations or ordinances must affect purely local matters only. For example, the Legislature has passed laws making it a crime to tamper with the switches, rails, ties, etc., of railroads. Such a law the Board of Aldermen could not pass, except as applied to railroads, or portions thereof, operated wholly within the City of New York. On the other hand, the Board of Aldermen can and has enacted certain regulations governing the manner in which merchants shall use the sidewalk in front of their stores and prescribing penalties for its violation. On the same principle the Legislature could not impose such a regulation on the citizens of New York, without its act being first submitted to our Mayor for approval.

By this discussion we have incidentally brought to light the fact that our city government, like that of the State, has three main branches—executive, legislative and judicial. A moment's reflection will show you that the same is true of the Federal, or national, Government. In fact, these three functions must exist in all governments, big or little. In all really civilized governments these three functions are distributed among three different sets of persons. Thus in effect

we have gone back to first principles and laid the broad foundation for the understanding of all matters of government.

### EIGHTH LESSON.

**Question.** What is the highest law of the State?

A. The Constitution is the highest law of the State, because no law passed is valid or binding if it in any way conflicts with its provisions. It is also sometimes referred to as the fundamental law of the State because it is at the foundation of all the law. It should not be overlooked, however, that even the State Constitution is subject to the Constitution of the United States, and also to all acts of Congress and United States treaties. Neither the Constitution nor the laws of any State may run counter to these. They, as well as the Constitution and laws of the particular State, are embraced under the expression "the law of the land" in any State.

**Question.** What is the Constitution of the State of New York?

A written document providing for the framework of our government in its three principal branches, that is to say, establishing the principal offices with the functions of each, and outlining in a systematic manner the general plan of administering the affairs of the

State, and laying down in addition certain broad principles for the preservation of the civil and political rights of the individual.

A brief analysis of this document will help a great deal in the understanding of all our institutions. There are a great many men who go to the polls and vote, vote on constitutional amendments even, who have never examined the Constitution, or who, if they have read it, still have a very hazy notion of it, thinking of it more or less vaguely as the "citadel of our liberties," and the like.

But, primarily, our Constitution, like the Constitution of the United States, like all constitutions, in fact, was intended as an accurate description of our form of government. It is just as if you were forming a social or political club or association. You would, first of all, adopt a constitution. In it you would set forth how many and what officers the club should have, and the powers and duties of each. In addition, you might provide something as to the rights and privileges of members. Thereafter you might adopt all sorts of by-laws, but all such would have to conform to the constitution.

Such in substance are all governmental constitutions. They provide for the form of government as well as outlining the people's rights.

Then all laws must conform. It is worthy of note that the entire Federal Constitution was drawn, signed and adopted without a single provision looking to the rights and liberties of citizens. It was merely a dry-as-dust outline of a form of government. Rights and liberties were dealt with later in the amendments.

Q.—What are the political and civil rights of a citizen of this State and how are they secured?

A.—HIS POLITICAL RIGHTS are to vote and to hold office, if duly elected. Political rights are forfeitable upon conviction of a felony.

HIS CIVIL RIGHTS, which are not forfeitable, consist chiefly of RELIGIOUS FREEDOM, that is, the right to worship unmolested according to one's own faith. FREEDOM OF SPEECH and freedom of the press, the right to utter publicly by speaking, writing or printing, one's opinions on all subjects; a right subject only to the right of the government to suppress treasonable, rebellious or seditious utterances, and to the right of every individual to be protected in his reputation against slander and libel.

FREEDOM FROM ARBITRARY GOVERNMENTAL OPPRESSION, such as the confiscation of papers or property or the quartering of troops upon our citizens in times of peace; the issuance of general search warrants where no specific crime is charged ("Every man's house is his castle"); the imposition

of excessive and inordinate fines, the exaction of excessive bail, or the infliction of cruel or unusual punishments.

The right of life, liberty and property of which no man may be deprived without due process of law, under which general head come all the guaranties of justice provided for persons accused of crime—the right to be both indicted and tried by a jury of his peers (which means merely his equals, citizens in private life like himself); the right to a speedy and public trial; the right to be confronted by the witnesses and to compel the attendance of witnesses in his own behalf; the right to appear in person or by counsel (by statutory provision, counsel must be furnished poor persons at the expense of the county, but this is not a constitutional right); the right not to be compelled to testify against himself, that is, that no defendant need take the witness stand to explain his acts, and if he do not, he must still be presumed innocent until proven guilty, or if he do take the stand, he may refuse to answer any question on the ground that it might tend to incriminate him, and yet must still have the benefit of the presumption of innocence; the right not to be twice put in jeopardy of life or limb for the same offense. (This does not apply, of course, to the case of a person tried a second time after an appeal, for then the accused has asked for a

new trial; this provision explains why a District-Attorney never appeals a case, a question that might well be asked.)

Then there is the right of the people to bear arms, which does not mean that every one may carry a gun. The police power of the State rightfully regulates that subject; but in order that the Government may never override the people by military force, they have the general right to arm themselves in self defense, and the separate States may maintain militia, etc.

Again, the right to peaceably assemble, akin to the right of free speech, and subject, of course, to the same regulations as to mob violence and sedition.

And, finally, the right to personal liberty, that is, that no person shall be given or sold into slavery, or in any manner reduced to a state of involuntary servitude, except as a punishment for crime.

These rights are secured by the first eight amendments to the Federal (U. S.) Constitution, and by the first Article of the State Constitution. These portions of both constitutions have sometimes been referred to as a "Bill of Rights," and they really go back to the "Bill of Rights" secured by the English when James II. was deposed, and William and Mary called to the throne in 1689.

The "political rights" are embraced in both constitutions; so are all the civil rights, with these exceptions; that this, that the right to bear arms and the exemption from involuntary servitude are provisions of the Federal Constitution only.

There are two other civil rights secured only by the State Constitution, namely, the right of habeas corpus, which means that any person restrained of his liberty is entitled to be produced bodily in court, that the court may in his presence inquire into the cause of his detention and ascertain if it is legal. This is done on a writ issued by the court to the sheriff or other alleged custodian of the prisoner, and the words "habeas corpus" are the beginning of the Latin phrase, meaning "Thou shalt have the body" of the prisoner in court on a certain time, etc. All law documents were formerly in Latin.

The right to recover damages for injuries resulting in death, a right accruing to the next of kin of the deceased. At common law the right to recover for such injuries was a personal one and did not survive the injured person.

Naturally, no candidate could be expected to go thus fully into a description of our Constitution in answering one question; but unless you understand it fully, your answers, however brief, are likely to go wide of the mark; and, moreover, there is no point in

it that might not be made the object of some particular question.

Question—How is the Constitution amended?

Answer—The present Constitution was the work of a constitutional convention, and was adopted in 1894. An amendment must be passed by both houses of the Legislature. It then awaits the action of the next Legislature chosen at a general election of Senators. If again passed it is submitted to the people at the next general election, and passes or fails by a majority vote. Provision is also made for constitutional conventions for general revision once in twenty years, if voted for by the people. In any case the people must finally adopt all changes by direct vote.

## NINTH LESSON.

In a former lesson we considered in a general way the subdivision of powers of government into executive, legislative and judicial. In the same lesson were outlined the general subjects of legislation. We have also pointed out in a recent lesson some restraints on legislation arising from the Constitution. There is another class of restrictions placed upon legislation by the Constitution—namely, the prohibition of private, special or local legislation on certain subjects. For instance, if you want to change your name, the Legis-

lature has provided a method of doing so by application to the court; but it is prohibited from changing it for you by a special act.

The other subjects on which local legislation is prohibited are, briefly: Opening streets or roads, locating county seats, changing the venue in actions (that is, removing them from one county to another), incorporating villages, holding elections, choosing jurors, regulating interest, changing salaries or fees of public officers during their term of office, granting the right to lay railroad tracks or any exclusive franchise or privilege or any exemption from taxation, whether to corporations or individuals; building of bridges, except below Waterford on the East River and over the border waters of the State. On all these subjects the laws must be general; that is, must provide a method for their regulation throughout the State. The reasons are fairly obvious to prevent injustice to localities on the one hand and undue favoritism to places or individuals on the other. Of course, there remain numerous subjects on which local legislation may be had, but only one object may be effected by any one act, and that object must be inserted in the title. This is to prevent "sneaking through" a general law as a "rider" to an unimportant local bill.

With regard to local legislation affecting New York City, it is provided that laws affecting any city must

be submitted to the local authorities for approval, to the Mayor in cities of the first class, and to the Mayor and local legislative body in all others. Cities of 250,000 or over are "first class," 50,000 to 250,000 "second class" and all others "third class." The Mayor may hold the bill fifteen days and must give public hearing on it. If he returns it approved it becomes a law. If he returns it disapproved it may be repassed, subject to the Governor's usual veto powers. If he retains it past the fifteen days it has the same effect as if he returned it disapproved. If, at the time of disapproval on the expiration of the fifteen days the Legislature has adjourned, the law is permanently defeated.

Now, as to the manner in which laws are made. A law during its passage is called a bill, after its passage an act. The new statute is properly applied only to general acts regulating matters of common concern. A bill may originate in either house, but must be passed by both.

By house we mean the two branches of the Legislature, Assembly and Senate. In the same way we speak of the two houses of Congress—Senate and House of Representatives. The term was borrowed from England, where the lawmakers are divided between the House of Commons and the House of Lords.

An Assemblyman, we will say, introduces a bill. He hands his measure, written or typewritten, to the

clerk, who gives it to the Speaker. The Speaker is the presiding officer of the Assembly, chosen by the members from their own number. In the Senate, the Lieutenant-Governor elected presides.

The Speaker announces the bill, reading its title. This is called its "first reading." The bill is then referred by motion to the proper committee. The committees of both houses do the most important work. The Legislature as a whole could never fully consider all the measures that are introduced. Hence both houses are resolved into committees, each handling a particular kind of legislation—Cities, Railroads, Finance, Codes, Judiciary Committees, etc.

A bill may be in committee that is never reported out unless there is a strong enough support to order it reported by a vote of the House itself. And, except with very important measures, the report of the committee, favorable or unfavorable, governs the action of the House. Most bills reported favorably are passed without discussion. While the bill is in committee, opportunity is given the public to show their approval or disapproval, either at a public hearing or by submitting arguments, petitions, etc., for or against. When a bill is reported out of committee and taken up for discussion that is called its second hearing. If passed (provisionally) at this time, with or without such amendments as may now be offered,

it is printed in its final form, when it must lie on the clerk's desk, copies being distributed to members, for three legislative days. At the expiration of that time a vote is taken, which is called the bill's "third reading," and the result of this vote either passes or defeats the bill. By special message from the Governor the three days interval between first and second reading may be dispensed with. Also, to expedite matters, the House often goes into Committee of the Whole—that is, lays aside all rules, to permit greater freedom of debate. In order to vote, however, they must return to the regular order of things, no final action being possible in "Committee of the Whole."

If the supposed bill which we have been considering passes the Assembly, it will be sent at once to the Senate, where it will run the same course as in the Assembly. If amended here, it must be sent back for repassage (or rejection) in its new form. After finally passing both Houses it goes to the Governor. If he signs it, it becomes a law, either at once, or at a date fixed by general legislative action (as for sections of the penal code, etc.), or at a date named in the bill. If the Legislature is in session, the Governor may hold the bill for ten days. If he sends it back vetoed, or holds it more than the ten days, the House in which it originated may reconsider it, and by a two-thirds vote of both Houses it will become a

law. If the Legislature has adjourned, the Governor has thirty days to consider a bill, and if he fails to sign it within that time, it fails to become operative. Besides the amendments which a bill receives during passage, it should be noted that many acts are merely amendments of existing acts; all such amendatory acts must show their character in the titles.

The members of both Houses are elected directly by the people, Senators for two years, Assemblymen for one year, both at the same salary—\$1,500 and mileage. The Constitution divides the State into 50 Senate and 150 Assembly districts. This number is not fixed, however, for it also provides that once in ten years a census of the population, be taken, upon the returns from which the State is redistricted. The last such rearrangement was made in 1906. By this means Kings County obtained one new Senator and two additional Assemblymen. So the Legislature now consists of 51 Senators and 152 Assemblymen. Provision is made so that in redistricting, no county, or no two contiguous counties, may obtain a majority of the legislators.

One difference should be noted between Congress and the State Legislature. In order to preserve the independence of the separate States, Congress can legislate only on such subjects as are specified by the

United States Constitution. State legislatures, on the other hand, may legislate on any subject not prohibited by the Constitution of the State or the United States.

Besides making laws the Legislature elects United States Senators and Regents of the State University. Also the Senate must concur in most important appointments of the Governor to make them valid. And the Senate also, with the Justices of the Court of Appeals, constitutes the Court of Impeachment, though the charge of impeachment originates in the Assembly.

## CHAPTER X.

### SCHOOL OF INSTRUCTION.

Probationary firemen undergo a course of instruction for twenty-one working days at the School of Instruction, during which period is thoroughly explained to them the following:

The facings, salute, marching by fours, marching in company front and column of fours.

How to stand on ladders.

How to handle ladders.

How to climb ladders.

How to come down ropes.

How to carry a man down and lower others on ropes.

Jumping into life net.

How to throw line to roof.

How to take up and lower large ladders to and from roof.

How to straddle and stand on window sills with one ladder.

How to jump from one line of windows to another or from house to house.

How to raise, lower and properly handle 25, 35 and 50 foot ladders.

How to connect all sizes of hose to stand pipes, to sub-cellar and cellar pipes.

How to connect 2 1-2 inch hose to larger hose and to water towers.

How to make different kinds of knots best adapted for fire department purposes.

How to send an alarm of fire from street boxes and to set auxiliary connections.

How to open door of street boxes and to set auxiliary connections.

How to use door opener, lock opener, hose jacket, hose roller, wire cutter and glass breaker.

Use of two way and four way connections.

How to connect line leading to roof through buildings.

How to stretch line of hose to roof by way of stairs, fire escapes and ladders.

How to take line up on outside of building and how to tie line properly at roof and on buildings.

Thorough instructions as to existing laws, rules, regulations, etc.

The necessity of strict and implicit obedience and the prompt execution of orders when given, neatness in appearance at all times, and deportment at fires, handling no merchandise, etc., except in strict line of fire duty. Also course of instruction in "First Aid to the Injured."



# First Lessons in Fire Fighting

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BY CAPTAIN JOSEPH QUINN

*of the New York Fire Department*



# FIRE FIGHTING

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## FIRST LESSON.

### Fire, Its Causes and Origin.

Fire is caused by intent, carelessness, accident or spontaneous combustion, and may be classed as slow and quick burning. By intent is meant incendiarism or arson in all its degrees. By carelessness is meant using naphtha near an open flame, careless use of matches, oil lamps, oil stoves, candles, unprotected gas brackets and a thousand other ways. By accident is meant fires caused from defective flues, electric wires, gas leaks, or similar occurrences. By spontaneous combustion is meant fires caused by self-ignition, such as from oil-soaked rags, paper or cotton waste locked or confined in closets or other close places, vegetable oils and chemical combustion. Dust, cotton, hay and other vegetable fibres, corn and other grains, when packed or in heaps or confined and allowed to become wet or damp will cause spontaneous combustion.

Fire in buildings of various construction, locations and conditions must be fought according to the cir-

cumstances of each case and no set rules can be made as to the placing of hose lines or companies.

In buildings having a large inside area without partitions such as churches, theatres, halls, drygoods houses, factories, etc., fire is drawn upward quickly and spreads rapidly. The same occurs when fire is near or on the line of an open stairway, shaft, or in large open rooms, halls, corridors, or cellars, especially when they are in high buildings.

Ordinary material when on fire and closed in a small room or space will not burn with the same rapidity as when in a large room or space. The reason for this is that material on fire will not burn without air; the larger the air space the better it will burn and the quicker it burns the greater the draught it will create.

A building may be compared to a large stove. When a new fire is made in a stove and the draught door at the bottom and the damper of the smoke pipe opened the fire will go roaring up the pipe and flue; it will act the same in a building under similar circumstances.

## SECOND LESSON.

### A Few Important Don'ts.

The actual duty of firemen is to prevent and extinguish fires with the least possible damage to life, limb and property.

Firemen in their eagerness to extinguish fires are sometimes negligent in their duty relative to property, and valuable property has been lost or destroyed by carelessness in the extinguishment of fires.

Avoid putting water on property or goods that are not on fire unless the same are in actual danger.

Do not open a pipe or nozzle until fire is seen and not on smoke. This is not intended to mean in cases where heat, gases or fumes of ammonia or acids are accumulating which could be driven back with a stream and the seat of the fire reached, or where a life is in danger.

Do not open a pipe or nozzle full force when a small stream would extinguish the fire.

Do not remove the tip of the nozzle unless it is necessary.

Do not put more water on a fire than is necessary to extinguish it.

Do not upset with a stream materials that are not on fire or trample on them while working at fires, but place them carefully to one side.

Do not pull down ceilings or other burnt material on top of goods that are not on fire. When there are large quantities of goods which cannot be removed readily the Fire Insurance Patrolmen should be allowed to spread their covers over the same before a ceiling or other material is pulled down on top

of them or before water is used, that is, whenever it is possible to do so without danger of the fire extending.

Do not move anything that appears in any manner suspicious of incendiarism, or that would be liable to cause fire if moved, until every precaution is taken and the officer in charge or the proper authorities notified.

Do not throw clothing or articles out of a building unless it is necessary to do so for safety, or to extinguish or prevent the spread of the fire or unless specially directed to do so by the officer in charge at the fire. All articles of value are collected by the Fire Insurance Patrolmen at or after fires, and when they are thrown out of a building it gives them unnecessary work collecting the same.

The Fire Insurance Patrolmen should be given assistance in saving property at fires and care should be taken by firemen not to injure their covers by jamming the points of hooks or the blades of axes into them or in any other manner.

### THIRD LESSON.

#### Two Branches of Fire Duty.

A fireman's duty is divided into two branches, both working harmoniously together; they are known as Engine or Hose and Truck duty.

A good officer or fireman will thoroughly familiarize himself with both branches of the service and see that all apparatus, horses, harness, hose, ladders, tools, and other implements intrusted to his care are always in good order and ready for immediate use. He should learn how to use them and also familiarize himself with all apparatus of the department.

It is very much to their advantage for firemen to be familiar with the construction of buildings when fighting fire in them, so as to know the manner in which fire will travel and spread unseen between beams, between floors, behind lath and plaster, through pipe holes, belt holes, in recesses and other hollow spaces, up dumb-waiter, elevator, air and light shafts, up stairways, across hanging ceilings, through cornices, etc., and know how to quickly get at the fire.

It is also very much to the advantage of firemen when fighting fire in a smoke charged building, if they know the interior plan and construction, where the stairways, halls, elevators, entrances and exits to all parts are located, and also the contents of the building. All firemen should familiarize themselves with every building within the district where they respond to fires on the first alarm, and every company should have in quarters drawings and a description of each building and its contents.

The first duty of an officer in command at any fire is to direct the Company or Companies under his command, to work at the best possible places of advantage in order to extinguish the fire in the quickest time with the least damage to property. A Company Commander should direct the members of his company to keep together (unless otherwise ordered), so that they may relieve one another in case of any work to be performed in extinguishing fire or saving life or property.

The first duty of firemen at fires is to obey orders from all superiors, to work together harmoniously, quickly and coolly, using common sense and discretion at all times and not wander around or become separated from their companies when working at fires.

Officers and firemen when at fires should work together and avoid as much as possible shouting and confusion of orders and answers.

The officer first to arrive at or in charge at any fire which is in a cellar, sub-cellars, or on any separate floor, room or part of any building, should, after directing the company or companies under his command immediately examine or cause to be examined the floor above the fire for the purpose of ascertaining whether the fire has extended to the floor above through shafts, stairways, openings, hollow partitions,

recesses, pipe holes, or in any other manner and prevent the fire from extending by use of second lines or second company lines.

The first duty of an Engine or Hose Company first to arrive at a fire is to get a stream of water on the fire if a stream is required. If the fire is endangering the life of any person or persons the line, pipe, or nozzle should not be left or stretching in the line stopped by the members of a company in an effort to rescue the endangered person or persons as very often by getting a stream of water on the fire greatly lessens or entirely removes the danger to the person or persons.

If the person or persons are in great danger or about to jump from upper windows, men who can be spared from the line and any citizens present should be utilized to effect the rescue by holding the jumping net or by the use of scaling or other ladders or in such manner as may be required, but under no circumstances should a line be left entirely alone or the stretching in of the same stopped.

Horse blankets can be used for jumping nets in extreme cases or where the regular jumping nets are not at hand or sufficient or the distance not too great. The first Engine or Hose Company to arrive at a fire should always connect the engine or hose to the hydrant or take suction as the case may be and stretch

the hose line to the building whether the fire can be seen or not and they should not take any person's word for it that the fire is out unless it be from a member of the Fire Department.

Drivers, when taking a hydrant should not pass the fire to take one on the opposite side unless quicker time can be made by so doing. They should try to take the hydrant on the side by which they are proceeding and stretch the line from there to the fire.

When stretching in, hose lines should be laid as near the curb as possible and on the side of the street or avenue on which the engine or hydrant is located so that other apparatus following will not run over the hose. The hose should also be allowed to run off the wagon and not be pulled off in folds, so as to have no surplus hose lying in the street.

Drivers should avoid running over hose at all times where it is possible to do so.

The next duty after stretching in a line of hose is to take off a sufficient number of lengths of hose to reach the fire and allow enough to spare in case the fire extends. This requires judgment and experience and it is always better to have an extra length than not enough, as a few minutes' delay sometimes causes a loss of thousands of dollars worth of property.

Engine or Hose Companies arriving at a fire after the first Company should first report to the officer

in charge at the fire before stretching in their lines, as the officer in charge may require their lines at a certain place.

Engine or Hose Companies equipped with both three and two and a half inch hose should on their arrival at second or greater alarms of fire, when ordered to stretch in, stretch to the building or fire with the three inch hose and if necessary to enter the building or for any other purpose fill out with the two and a half inch hose unless otherwise directed.

After a Company has stretched in their lines and the nozzle or pipe has been put on and the water started, the kinks should be immediately taken out of the line as they tend to reduce the pressure at the nozzle and are also liable to burst the hose.

When moving or lightening up on a line of hose whether it is charged with water or not it should be caught hold of near the couplings and if necessary a man placed at the center of each length or every twenty-five feet; this prevents the lugs on the couplings from catching on anything and makes it easier to move the line.

## FOURTH LESSON.

### How to Handle Nozzles.

All firemen should know how to handle and operate the pipes, nozzles and distributors of all kinds,

when and how to shut them off and what to do in cases of emergency.

When there is but one man on an open pipe or nozzle and the pressure is more than he can hold and no assistance comes to his call he can obtain relief by pressing the side of the pipe or nozzle against some solid obstacle, wall, etc., or by throwing his weight upon it. To let go of an open pipe or nozzle with high pressure on the line is a dangerous thing to do and the man that does it is liable to be struck on the head with the pipe or nozzle and killed or seriously injured.

Controlling or shut-off nozzles should not be shut off when the engine is working at high pressure or when there is high pressure on the line, until word is sent to the Engineer and the pressure has been reduced at the engine or in case of a high pressure hydrant it has been reduced at the hydrant, as shutting off at high pressure tends to burst the hose or cause the engine to stop working.

A shut-off nozzle should never be shut off suddenly, whether working at high or low pressure. It should always be shut off gradually and in cases where it will not cause damage by water, it should be shut off only partly until the pressure has been reduced at the engine or hydrant.

Nothing in the foregoing is meant for circumstances where life would be endangered by not shutting off such as on a slippery roof where the pipeman would be liable to be carried off with the back pressure.

A pipe holder or pipe stick should invariably be used when there is high pressure on the line whether working inside or outside of a building.

If while working with a line inside of a building a shut-off nozzle is leaking or the stream from an open pipe is not required for immediate use and it is liable to cause unnecessary damage by water, the pipe should be placed outside of a window until it is required again, but in doing so care should be taken that no damage is done to outside property.

When the nozzle is only leaking it can be placed in a sink, bath tub, or other convenient place where it will not do damage.

In freezing weather it is often necessary to leave the pipe or nozzle partly open when the line is charged and not in use so as to prevent ice forming in them.

A pipeman should always remember when he is working in a smoky or dark place that he can invariably find his way out in case of any emergency by following the line back and out.

A pipeman should also remember when he is working in a smoky or close place that the nearer he gets to

the floor and his face to the nozzle he will get less punishment from heat and smoke and he will be able to hold out much longer.

When a pipe or nozzle is first opened after the water has been started air comes before the water; there is also a certain amount of air that comes continually with the water and the pipeman by keeping his face near the open pipe or nozzle and getting close to the floor can breathe a certain amount of this air. An experienced fireman will always do this.

When a fire has full possession of any floor, space, room or part of a building, the pipeman should direct the stream from the nozzle upward and all around the ceiling; by so doing the water reaches all the fire above and also falls on that beneath.

When directing a stream up to a ceiling or in fact in any direction care should be taken not to put water on exposed and heated iron or steel beams, posts, or columns, as the cold water coming in contact with the hot metal will cause it to warp and twist or crack and break and is liable to carry down concrete ceilings, floors, or the entire building. The same precaution should be taken when fighting fire in the subways where there is considerable fire which has heated the steel beams and concrete roof above.

A pipeman when directing a stream from a pipe or nozzle should, unless otherwise directed for reasons

of danger or other good causes, always follow up a fire with the stream to its origin or to the body of the fire, that is, when driving flame before him he should always follow it up to its source.

When fighting fire which is traveling up a stairway, it can be fought with a great deal less punishment from heat and smoke by following it up with a stream from underneath, but the scuttle or roof door over the stairway should be opened to permit the heat, smoke and gases to escape.

When stretching a line of hose up a stairway it should be laid around the stairs and not stretched through the well hole, as in the latter perpendicular manner the line is liable to get jammed or caught if the well hole is narrow; or it is liable to become twisted and when charged with water is apt to unscrew at the couplings. Besides it is easier to back down to a floor below when the line is passed around the stairway.

A line of hose can be stretched much quicker through the well hole of a stairway (when the space permits) than it can be laid around the stairway, and in extreme cases, or where a line is short, or a stream required quickly, it should be stretched through the well hole.

When a Company or Companies are fighting fire up a stairway from underneath no other company should

open their pipe or nozzle at the roof stairway opening, or scuttle on the roof, and direct their stream straight down the stairs, as this only drives the heat and smoke down on the men beneath, prevents them from moving upward, and causes a backdraught.

The foregoing is not meant to include very tall buildings where the whole stairway is on fire and the company or companies on the stairs below are a considerable distance from the roof; nevertheless it will cause a backdraught.

If additional companies to those on the stairway are required they should be directed to enter the various floors of the building by way of fire escapes, ladders, or through adjoining buildings and to move upward and direct their streams upward and in on the floors if necessary, but never downward unless the fire warrants it, or unless they are satisfied the companies beneath are not in operation.

A pipeman should always remember that when a fire is some distance in on a floor, the heat and smoke are more intense near the open doors or windows than they are near the fire and that by moving in some distance on the floor he will receive a great deal less punishment and be able to extinguish the fire much quicker and with less water. The reason for this is, fire will not burn without air and the heat and smoke caused

by combustion always ascends, makes for, or follows an opening.

When fire is traveling up a partition or other hollow space and there is no Truck Company present to open up the same a hole should be kicked or made in the partition or hollow space and the pipe inserted and the stream directed upward so as to reach any fire that may have ascended above the opening. The pipe should also be inserted between floor beams and the stream directed in like manner where fire is extending between them.

When fire has entered a hanging ceiling in any building and is liable to extend or is extending throughout the same, or where there is a row of buildings in similar danger, the lath and plaster or other covering should be removed from around the scuttle or approach to the roof just above the ceiling. By so doing, the entire hanging ceiling is exposed to view and can be swept with a stream and any fire therein quickly extinguished without the necessity of pulling down ceilings on top of the contents of the building and damaging them unnecessarily. If the fire is extending to more than one building the lath and plaster or other covering around the scuttle or approach to the roof should be removed from each and streams directed therein.

Fire in hanging ceilings will often spread throughout an entire ceiling or row of ceilings and drop down to the bottom of hollow partitions or other spaces and extend throughout a whole building or row of buildings, especially if they are of frame construction. This can be prevented by following the foregoing method of fighting such fires, from the approach to the scuttle or roof.

## FIFTH LESSON.

### Standpipes and Auxiliary Fire Appliances.

Firemen should be familiar with the handling and operation of the various auxiliary fire appliances and systems which are placed in buildings or elsewhere and also to know the general location of the boilers, engine room, pumps, shut-off valve or water supply to pumps, stand-pipes, tank, hose, automatic sprinkler system, dry pipe system, perforated pipe system, hose line system, and all other fire appliances such as liquid extinguishers, chemical powder, sand boxes, hooks, axes, etc.

There are three kinds of stand-pipe systems used in the various buildings and every fireman should know how to tell the different kinds so as to make no error and connect to the wrong pipe when ordered to connect to any one of them.

One of the stand-pipe systems placed in buildings or elsewhere is that to which hose lines are attached and supplied with water from a tank on the roof or upper part of the building; the said tank is generally kept full of water by a pump in the building or by direct pressure from the street main. These stand-pipes have a siamese or two-way connection on the outside of buildings, to which firemen can attach their lines and pump water from an engine or hydrant into the tank or direct to the stand-pipes and hose lines.

These connections are generally not designated by any sign or metal plate. Some have a sign "Fire Department stand-pipe, steamer connection."

Another kind is the stand-pipes connected to automatic sprinkler systems and supplied with water from a large tank on the roof or upper part of the building; the tank is generally kept full of water by a pump in the building or by direct pressure from the street main.

This kind of stand-pipe also has an outside siamese or two-way connection so arranged that firemen can connect their lines to the same and pump water from their engines or hydrants direct to the stand-pipes and sprinklers.

These connections generally have a metal plate above with the raised letters "**Automatic Sprinklers.**"

Automatic sprinklers are of various kinds, and are set off by heat or fire melting the glass or soft metal

of the sprinkler plug, or by accident. When an automatic sprinkler head or plug has been broken by accident or has burst from the heat of a fire which it has extinguished and it is doing unnecessary damage by water it should be immediately shut off at the valve of stand-pipe on the floor where the sprinkler is located, or at the main valve near the tank.

When it is not possible to reach or shut off any of the valves of a stand-pipe connected to a burst or broken automatic sprinkler head or plug, a length of hose may be used to advantage by passing the she coupling of the same over the sprinkler head and the other end out of the window, thus diverting the water spouting from the sprinkler from doing unnecessary damage within the building.

Another kind of stand-pipe is the perforated pipe system; these are generally distributed under the ceilings of cellars or sub-cellars, separately, and also have siamese or two-way connections on the outside of the building to which firemen may connect their lines and pump water from an engine or hydrant through the same. Each connection has a metal plate with raised letters near it which reads: "**This stand-pipe connects to perforated pipes in the cellar, or sub-cellar;**" if such is the case.

When there are no metal plates or signs near the connections to stand-pipes or nothing by which to tell

the kind of stand-pipes they are, and a Company has been ordered to connect to a certain kind of stand-pipe, care should be taken to ascertain that it is the right pipe before the connection is made and the water started as great damage may be done from water by connecting to the wrong pipe.

When there is fire in the upper part of a building, and a company has stretched its lines into, or has been ordered to stretch into a stand-pipe, and go to a certain floor to operate the hose lines thereon, they should always take with them at least two lengths of two and a half inch hose for the purpose of connecting the same to the stand-pipe on the floors above if necessary, or in case the hose already attached is not strong enough to stand the pressure of water or is unfit for use.

After a company has connected to a stand-pipe and is operating the hose lines on an upper floor of a building, the officer in charge of the company should send a fireman to examine the valves where hose is attached to the stand-pipe on the other floors (and not in use) to see that they are closed, for if they should be open considerable damage may result when the water is started.

When fighting fire with hose lines connected to stand-pipes they are generally connected and stretched from the floor below the fire, but they may be con-

nected and stretched on the same floor with the fire if the fire is not too close to the connection.

The two-way or siamese connections to stand-pipes to be found on the outside of buildings or elsewhere, have clapper valves in them to prevent the water from backing out when only one line is connected to the same and in use; these clapper valves should always be examined to see that they are put on in a proper manner as they are sometimes put on reverse or improperly and do not close with the back pressure when the stand-pipe is charged with water from one line.

When an Engine or Hose Company is ordered to connect to a stand-pipe having an outside two-way or siamese connection it is always advisable to use two lines from the engine or hydrant when making the connection so as to get the full discharge of water and also to guard against either clapper valve leaking or being out of order.

## SIXTH LESSON.

### **Cellar, Sub-cellar, Subway and Ship Fires.**

When there is a fire in a cellar or sub-cellar of any building and it threatens to extend upward on the inside, the first Engine or Hose Company to arrive should stretch their lines inside the building so as to prevent

the fire from extending upward by inside stairway, elevator, or other shaft, or by any hollow space or opening; second lines or second company lines should also be stretched in like manner if the case requires it, or through outside elevator hoists or other outside front or rear openings to the cellar or sub-cellars, so as to reach the body of the fire with streams, if the inside company or companies are unable to do so.

Buildings having cellars or sub-cellars generally have outside entrances to them in the rear; and sub-cellars in most cases have light shafts or areas in the rear of them from which a fire in the sub-cellars can often be fought readily and successfully with streams, by stretching lines of hose through the cellar and sub-cellars of the adjoining building or buildings and across the areas of light shafts to the sub-cellars of the building in which the fire is located.

Fire in a cellar or sub-cellars should be thoroughly ventilated and fought with a stream or streams at or as near as possible to the body or seat of the fire; that is, if a fire is in the rear of a cellar or sub-cellars it should be ventilated and fought at the rear; if in the front it should be ventilated and fought at the front, but care should be taken not to drive the fire with the force of the stream on goods or articles that are not on fire; in all cases a pipeman should try to

direct the stream directly at the body of the fire and away from goods or articles or material not on fire.

Whether fighting fire in a cellar, or sub-cellars, from the front or rear, the inside of the building should always be protected by a line or lines to prevent the fire from extending upward.

Good ventilation is also very important when fighting fire in a cellar or sub-cellars and all outside openings, vault covers, outside elevators, hoists, deadlights, etc., should be opened if the case requires it.

Firemen should particularly familiarize themselves with and know how to tell, and how to connect to the perforated pipe systems installed in buildings for the purpose of extinguishing cellar or sub-cellars fires, and also know how to operate; they should also know how to connect their lines to, and operate, the cellar, sub-cellars, Baker, or other special pipes or distributers used for fighting cellar or sub-cellars fires.

The cellar, sub-cellars, Baker or other special pipes when used at a fire should be connected to lines of hose, lowered into the cellar or sub-cellars and turned so as when the water is started the stream will reach the body of the fire.

Distributers when used at a fire should be connected to lines of hose, and lowered about two feet below the ceiling directly over the place where the fire is located and the water started.

All cellar pipes, sub-cellars pipes, Baker or other special pipes or distributers when in use should be shut off as soon as the fire is under control, so as not to do any more damage by water than is absolutely necessary.

When fighting fire in subway, elevated, or other electric cars, in which the fire has full possession, the stream should be directed to the ceiling or upper part of the car through the doors or windows, thus letting the water fall to the floor and avoiding shock from electricity. The pipeman when directing a stream and there is danger from electric shock should avoid handling the brass or metal pipe or nozzle. He should direct the stream by catching hold of the hose back of the nozzle or pipe, and when possible to obtain them, he should wear rubber gloves; he should also avoid directing the stream low down on the third rail or any connections to the same.

When there is a fire in the subway between stations or ventilators, notice should be taken in which direction the wind and smoke is blowing and the fire fought with streams from the least smoky side; to fight a fire in the subway from both directions, when it is located between stations or ventilators only tends to drive the smoke and heat from one company to another, causes unnecessary punishment and should not be resorted to

unless there is a station or ventilator near the fire by which the heat, smoke and gases can escape.

In all cases of danger; or fire where it is necessary to use a stream or streams from a line of lines at a fire in a subway, the agents of the stations on each side of the fire should be immediately notified to shut off or have shut off all electric power between those stations.

All subway stations are equipped with cut outs or switches for the purpose of cutting out the electric power between stations; they are also equipped with telephones by which communication can be had with the power stations and the electric power cut out entirely.

In addition to other precautions to prevent trains from approaching or passing any part of a subway where there is a fire and the lives of firemen or passengers become endangered, firemen with red lanterns should be stationed at each side of the fire to prevent the trains approaching.

Ship fires or fires below decks or in the hold of ships are somewhat similar to cellar or sub-cellars fires and should be thoroughly ventilated by opening hatches, port-holes, ventilators, or by cutting up a portion of the deck, according to the extent of the fire or the circumstances of each case.

When an entrance by the hatchway, stairway, or other opening to the hold of a ship is possible, the fire should be fought with a stream or streams from those entrances, and where it is impossible to enter the hold it should be fought with distributers, Baker, cellar or other special pipes placed in holes cut in the deck or from the ventilators, hatches, or other openings.

As fire will not burn without air there must be air in the hold of a ship or other vessel for fire to exist therein, and many serious looking ship fires have been extinguished with a single stream by a fireman taking the pipe or nozzle down the hatchway or other opening, and although severe punishment from heat and smoke may be encountered at the mouth of the hatchway or opening, down in the hold a man could breathe easily.

In all cases, when a fireman enters the hold of a ship, or other vessel, or subway, cellar or sub-cellars, man-hole or similar place, where there is considerable fire, smoke, heat, fumes or gases, a rope should be fastened around his body with which to pull him out in case he is overcome.

The smoke helmet may also be used to advantage when fighting fire in the hold of a ship, vessel, or in a subway, cellar, sub-cellars, or in places where there are dangerous gases, fumes or vapors, but when used a rope should be fastened around the body of the fire-

man using it and a code of prearranged signals made so that in case the fireman desires to ascend, is becoming exhausted, or in danger, he can be pulled out.

A good light (electric or acetylene gas preferred) is of great assistance when fighting fire in a dark cellar, sub-cellar, subway, hold of a ship, or similar places, and should be used if at hand, but no light with an open flame should be taken into any place where gases of an explosive nature have accumulated.

Some vessels are equipped with steam hose for the purpose of extinguishing fire, and this is the best thing with which to extinguish a fire in the hold of a ship or other vessel if the fire can be reached with it.

Many ships are also equipped with portable electric search lights that can be carried in the hand to any part of the ship and they are of great assistance when fighting a fire.

## SEVENTH LESSON.

### Roof Lines.

When a company has been ordered to stretch a line of hose to the roof of a building in which there are no stand-pipes or where the stand-pipes have already been taken by other companies, the line should be stretched on the outside of the building unless spe-

cially directed to do otherwise. The object of this is, in case the line should burst when it becomes charged it will not do any damage by water to the contents of the building; whereas, if it was stretched through the interior of the building and burst it would be liable to do considerable damage.

The manner of getting a roof line to work when there are no stand-pipes in a building is as follows:

After a company have stretched their line to the building and taken off sufficient hose to reach the roof they should allow at least one length free and clear on the roof in case it may be found necessary to enter the building, or another building from the roof.

The company should then (with the exception of one man) go to the roof; they should take with them a roof rope, hose roller, axe and the pipe or nozzle; when they reach the roof the rope should be lowered to the fireman below, who should tie on the line with a half hitch knot. The company on the roof should then hoist the line and as much surplus hose as they can get; fasten it with one end of the roof rope (using rolling hitch) below a coupling if possible and the other part of the rope secured to a chimney or other secure place.

An open pipe is generally used on a roof line, but controlling nozzles should be substituted when it is

found necessary to go inside a building where high pressure is not required.

A roof line, or a line of hose stretched perpendicularly to any great height is generally twisted when stretched, and if these twists are not taken out and the line straightened or the couplings tightened the line will be liable to unscrew at the couplings when it becomes charged with water.

When there are two or more lengths of hose in a line which has been stretched on the outside of a building or elsewhere in perpendicular position, each separate length should be tied and supported with a rope below the couplings so as to take the weight of the charged line off the couplings and to prevent them from pulling out.

When a company is working with a roof line on a roof, especially in freezing weather, and the roof is liable to become slippery, the pipe or nozzle should be tied to a chimney, iron shutter, or other secure and convenient place so as to prevent the back pressure from carrying the pipeman off the slippery roof. If it is not possible to tie the pipe in such cases the pipe holder or pipe stick should be used.

When fighting fire on the roof or upper floors of any building or at any high place, companies should always have with them a roof rope, hose roller, and axe; the roof rope and hose roller to pull up hose from

outside if required and the axe to open doors, partitions, etc. The rope also can be used as an escape in case the company is cut off from below.

When a rope is used as an escape from a height by sliding down it, it should be securely fastened at the top first, and the person sliding down should use a cloth, towel, or part of a coat, or similar material between the hands to prevent burning of the hands by friction; the legs should also be twined about the rope to prevent descending too rapidly.

#### **When Hose Bursts.**

When hose bursts in a building or in the street a hose jacket should be immediately put on over the break and if it is not sufficient to stop the leak the line should be immediately shut off at the engine or hydrant, the burst length taken out, and a good length substituted.

When hose stretched to the roof or upper floor of any building bursts near the roof or an upper floor window, it should be pulled up to the roof or upper floor window and the hose jacket put on the burst there. If the hose jacket does not stop the leak sufficiently the line should be shut off at the engine or hydrant, the line broken in the street and another length put in there, and the broken length pulled

up on the roof or upper floor and taken out. If an extra length is not required in such cases the line should be pulled up to the roof or upper window and the burst length taken out without breaking the line in the street.

When hose stretched on the outside of a building bursts near the street it should be lowered to the street and the hose jacket put on the burst there, or a good length substituted, as the case may require.

When hose is stretched across any railway tracks, especially in dark or unlighted streets or avenues, or at night, it should be guarded by a fireman with a red light, to prevent the cars or trains from running over and cutting the hose in two. When a line of hose has been cut in this manner another length should be immediately substituted or another line stretched, as the case may require.

#### Ladder Lines.

When stretching a line of hose up a ladder or fire escape the fireman on the pipe should always keep a firm hold of the nozzle and the ladder or fire escape, as the sudden charging of the line is liable to pull the pipe or nozzle out of his hands or throw him off the ladder or fire escape.

He should also always have with him a pipe strap or short piece of rope with which to fasten the pipe or nozzle to the ladder, or inside the window.

High pressure on a ladder line will sometimes lift the ladder out from the building and cause it to fall; this should always be guarded against by fastening the ladder and also notifying the engineer that the company is working on a ladder.

When stretching a line of hose through a window from a ladder the pipe or nozzle should be passed, either over the top or along the side of the ladder; the reason for this is, if the ladder is required at another window or for any other purpose, it can be moved readily without backing out the line.

When a company is directing a stream through a window or door from a ladder, fire escape, or other place, the pipe or nozzle can be securely fastened and the pipeman greatly relieved from the force of the back pressure or weight of the charged line, by fastening one end of a short piece of rope to the center of a six-foot hook and laying it inside the window or doorway across the frame, and the other end tied securely to the pipe or nozzle.

Ladders can be fastened and secured from falling in the same manner by tying the rope by the hook and a round of the ladder.

### Backing Out and Picking Up.

When an Engine Company has been ordered to pick up, or back down and out from the upper part of a building, the engineer should be notified, and after he has shut off on the line it should be disconnected at the first coupling outside of the building, so as to allow the water therein to run off in the street where it will do no damage; then the line should be backed out with the pipe or nozzle last:

When a company has been ordered to back out without the line they should do so immediately and without question for an officer in charge of a fire can often see more danger than a company or companies working within the building.

## EIGHTH LESSON.

### Hose, Nozzles and Pressures.

When water is pumped, discharged, or forced through hose, it meets with a certain resistance from friction or choking of the water in the hose, and causes what is known among firemen as back pressure. The faster water is pumped, discharged or forced through hose the more resistance and back pressure it will encounter, which simply means the greater the

pressure on a line of hose the greater the resistance or back pressure.

When high pressures are to be used in extinguishing a fire, larger hose and larger size nozzles should be used than when working with ordinary or low pressure so as to give the water under high pressure a freer discharge through the line and nozzle.

For all ordinary purposes the two and a half inch hose and the one and an eighth, one and a quarter and one and a half inch nozzles are sufficient, but when a pressure exceeding one hundred and twenty pounds at the pumps of an engine, or at a hydrant is required, and there are not more than twenty lengths of hose in line, larger size hose and nozzles or pipes should be used accordingly if they are at hand, and if not, two or more lines should be stretched near to the fire and siamesed into one line there, so as to give freer discharge to the increased pressure of water.

The size hose, nozzles, or pipes to be used when there is high pressure on a line, depends on the number of lengths of hose in the line, or the action of the engine if an engine is used; when an engine labors or the stream chokes at the mouth of a fully opened pipe or nozzle it is generally an indication that a larger size hose, pipe, or nozzle is required.

Nozzles or pipes should be changed or regulated to suit the various pressures, or the pressures increased

or reduced to suit various nozzles or pipes, to obtain the proper and most effective streams.

When there is low pressure on a line of hose and the nozzle or pipe opening is too large the stream will not be effective, and the size of the nozzle or pipe should be reduced until it is.

When there is high pressure on a line and the nozzle opening is too small, the water will choke at the mouth of the pipe and greatly effect the force of the stream or cause it to spray. In such cases the size of the nozzle or pipe should be increased until the most effective stream is obtained.

#### **Siamese and Relay Work.**

When the fire is at a considerable distance from an engine or high pressure hydrant, or is at a high altitude and an effective stream can not be obtained from one engine or high pressure hydrant line, two or more engines or high pressure lines should be used by siameseing them together, or else the engines should work in relays.

The object in siameseing two or more lines of hose together is to get one larger and more effective stream by uniting the force of the two or more lines into one.

There are also siamese connections in use by which two or more lines of hose may be obtained from one larger line; these connections are generally carried on the fire boats.

By siameseing is here meant using two-way, three-way, four or more way connections.

No set rule can be made as to siameseing near the engine or hydrant or near the fire when a single working line and stream is required; it all depends on the action of the engine or engines or the pressure at the hydrant or hydrants or the size of the hose and the number of lengths required.

When there is exceedingly high pressure required for a single working line and stream it is better to siamese near the fire so as to give the pressure of water a freer discharge, especially if the hose used is all the two and a half inch size; and when larger size hose than two and a half inch is used it can be siamesed between the engine or engines; or hydrant, or hydrants, in case they are of high pressure.

When only one engine is used for the purpose of obtaining a single line and stream the lines of hose may be siamesed near the engine or between the engine and the fire; that is, if the hose is of sufficient size to give a free discharge from the size and pumping capacity of the engine.

When more than two engine or high pressure hydrant lines are siamesed for the purpose of obtaining a single working line and stream they should, if possible, be siamesed near the fire.

When two or more engines are used for the purpose of obtaining a single working line and stream their lines should, if possible, be siamesed near the fire, and the engines should be kept working at similar pressures as any great variations of pressures of either would cause the clapper valve of the siamese on the least pressure side to close by the action of the highest pressure engine overcoming the other, and causing a back pressure. This would also cause the least pressure engine to stop or break down.

When it is necessary to obtain two or more working lines and streams from a single line of hose the siameseing should be done as near as possible to the fire.

Relay work consists of one engine pumping water to another through a line of hose and is used when the fire is at a great distance from the water supply, or on a high elevation of ground. The object of relay work is the nearer the working engine is to the fire and the less hose in line from the same, the better the stream.

When a stream is required at a great distance from the water supply or at a high elevation of ground one

engine can pump to another and that one to another and so on to as many as may be required; the last engine may be close to the fire. From twenty to fifty or more lengths of hose may be used between each engine according to the distance, elevation, or the pumping capacity of each engine or other circumstances effecting each case.

Relay work can be employed to advantage where there are rivers, lakes, reservoirs, ponds, streams, etc., from which suction can be had by an engine.

When small streams which do not afford a sufficient supply of water for suction are met with at a fire, and no other means of extinguishing the fire is obtainable, they should be dammed up with earth so as to make a pool into which the end of the suction can be inserted.

Different size hose may be used in relay work, but invariably the largest size should be used nearest to the water supply.

Engine Companies to work in relay should be equipped with all proper connections, reducers, etc.

## NINTH LESSON.

### Fire in New Buildings, Towers, Etc.

When there is considerable fire in any brick building or buildings, which are in course of construction,

it should, when possible, be fought with streams from street pipes or from adjoining buildings or from somewhere outside the buildings, as the walls of such buildings being new or what are known as green, will readily fall from the combined action of heat and water.

When there is fire in the upper part of a steeple, tower or other similar place or structure and a company or companies are operating with lines for the purpose of extinguishing the same, care should be taken, if it is necessary to ascend to the upper part, that the base is protected by a line or lines of hose as very often towers, steeples and similar structures, are furred out on the inside and fire will drop down these hollow spaces and start again at the bottom and cut off all those above.

Care should be taken when walking over the lofts of towers, steeples, domes of theatres, or similar places where there are hanging ceilings, to avoid falling through the same to the floor below.

### **Still Alarms.**

The officers of a company receiving a Still Alarm for fire should immediately send his out of service signal, by Morse key or telephone to Headquarters and respond without delay with his company and all apparatus to the location of the fire. This is intend-

ed to mean where the fire is still burning and has not been extinguished. It is always better to give a fire the benefit of the doubt and respond with the company and all apparatus than to send one or two firemen to investigate, which by so doing would cause delay and might give a fire great headway or cause considerable loss which otherwise by prompt action and response of the company would be avoided.

The officer in charge of the company or the house-watchman, on receiving a Still Alarm for fire should always obtain the exact location of the fire, whether the same has been received from a citizen or by telephone and when received from a citizen he should not permit the citizen to leave until the exact location is obtained.

## TENTH LESSON.

### Chimney Fires.

Water should not be used to extinguish fire in a chimney flue as it is liable to burst the flue or cause the chimney wall to crack; neither should a brick or any such article which would be liable to get caught in the flue be used.

To properly extinguish fire that is in a chimney flue, all the openings to the flue that are below the roof should first be closed up tightly so as to prevent

and doing unnecessary damage. Then a bag of salt, a pail of small coal, or a pail of sand, or other similar substance, should be dumped down the flue opening at the roof.

Salt extinguishes a chimney fire quickly by chemical action, when it comes in contact with the fire, and coal or sand will carry the soot down to the bottom of the flue, where it can be removed.

Chemical powders, composed chiefly of bi-carbonate of soda or similar salts are very good with which to extinguish fire in a chimney flue, by throwing a handful of the same up the opening at the bottom and then closing it to prevent the soot from falling and scattering about.

An ounce of sulphur, lighted, and placed in a stove, or at the bottom of a flue that is on fire, will quickly extinguish the fire with the fumes that ascend from it.

Another good method to extinguish fire in a chimney flue, where it is desired to remove the soot, is to get a dozen pieces of chain eight or ten inches long the falling soot from flying about the rooms or premises and with one-half or three-quarter inch links, tie them loosely together with wire, then attach to them a piece of the same kind of chain about ten feet long, and enough clothes line to reach from the top to the bottom of the flue. The bunched chain should then be dropped down at the top of the flue and pulled up and

down several times, after which the fire will have been extinguished and all the soot will have dropped to the bottom. All openings to the flue at the bottom and below the roof should be closed up tightly in this case, also before dropping the chain, and they should not be opened until the soot has settled, after which it should be removed gradually and carefully so as to prevent it from flying about and causing unnecessary damage.

A blank pistol shot fired upward from the bottom of a flue in which there is fire or soot will loosen the soot, and bring it down to the bottom, but this is not advisable as the falling soot is liable to scatter about.

A small fire cracker lighted and dropped down at the top of the flue is much better and less dangerous but all openings to the flue below the roof should be closed when the latter method is resorted to.

#### **Defective Flues.**

Defective flues are caused by some obstruction in the flue, or some defect in their construction that permits the smoke to issue from openings or crevices in the chimney wall where not intended to; this generally occurs between the floors and ceilings of a building where the chimney wall has been left un plastered, or where the mortar between the bricks has become loose,

or where wooden floor or roof beams have been permitted in violation of law, to enter the chimney walls. Sometimes the ends of these beams will become charred from heat of the flue, take fire, and the same will spread across the floor between the beams. The ceilings in such cases generally become blackened around the ends of the beams and is a warning that a defect exists.

When the defect is caused by smoke issuing from between the bricks for lack of mortar or for want of clay pipe lining and there is doubt as to which chimney flue is defective, a piece of cardboard or tin placed across the top of the suspected flue and a piece of paper burnt in the stove connected to the same will show where the defect is, as the smoke finding no outlet above will issue from the defect.

Defective flues should always be reported or remedied as they may cause loss of life and property by fire breaking out suddenly from them at any time.

#### **Grease, Oil, Paint, Tar, and Similar Fires.**

Grease, oil, paint, tar, or similar liquids or substances when on fire should, where possible, be smothered with sand, ashes, dirt, chemical powder, wet bags, or cloths, or similar substances, or materials.

Water put on oil, tar, paint, or similar liquids or substances when on fire has a tendency to spread the fire, and they will continue to burn on the top of the water.

For an oil stove fire, ashes, either wet or dry, or wet cloths, should be placed around, and if possible under the stove (without moving it) and the fire then smothered with wet cloths or bags. Any attempt to move an oil stove when it is on fire generally ends disastrously as the moving of it causes the oil to spill and spread the fire or explode the stove. It is especially dangerous to carry an oil stove on fire out into a hallway or other place where it will get a draught.

When the stove only is on fire and there is nothing near it to catch fire it is better to let it burn out gradually, protecting the floor with wet ashes, sand, dirt or wet bags or cloths.

In all cases of oil fires or fires of any kind where there is any doubt or danger of the fires extending, a line of hose or lines of hose should be stretched as an extra precaution.

When a pan of fat or grease is on fire in an oven it should be smothered with wet cloths, sand, or ashes. If the flames are coming out of the oven door it should be shut until wet cloths or ashes are procured. Fire in an oven can often be smothered with its own smoke by simply closing the oven door for a few minutes, and

dumping, withdrawing or smothering the fire in the grate.

When there is a pan of grease or fat on fire in the oven of a gas range the gas should first be shut off and then the fire extinguished with wet cloths or ashes or as previously described.

Oil when on fire (gasolene, naptha, benzine, and highly explosive oils excepted) will only burn on top or on its surface and is therefore better smothered with sand, ashes, dirt, wet bags or cloths. Steam is also an excellent extinguisher for oil fires if it can be blown over the surface of the oil on fire, and some oil plants are equipped with steam hose and a special steam pipe system for that purpose.

Some of the large oil plants like the Standard Oil Company, at Bayonne, New Jersey, are equipped with an air pump engine, sand hose, and nozzle, through which sand is forced to a great distance and covers the surface of any oil that takes fire and extinguishes it quickly. This system has been tried at a fire in the plant of that company and proved a great success, and is without doubt the best known extinguisher for oil fires.

Large oil tanks or reservoirs are often so arranged that in case of fire in or near one of them the oil can be drawn off at the bottom to another tank.

When working at fires where there are cans, bottles, tanks, barrels, boxes, packages or other vessels containing gasolene, naphtha, benzine, kerosene, paint, varnish, turpentine, chemicals or other similar highly explosive oils, liquids, or substances, care should be taken not to upset them either with the force of a stream or otherwise or allow fire to fall on or into them.

Firemen should also remember that gasolene, naphtha, benzine, kerosene, turpentine and similar quick burning or explosive oils may be met with in automobile garages, paint stores, drug houses, drug stores, dyeing and cleaning establishments, storage warehouses or other places specially designated for their use, sale or storage.

Every spark should be extinguished where there has been a fire in any building or premises containing any of the previously mentioned oils or liquids.

#### **Ammonia, Acids, Chemicals, Etc.**

When the fumes of ammonia, acid, sulphur, chemicals, or similar liquids or substances are escaping in a building it should be ventilated thoroughly. On entering such buildings a wet sponge or wet cloth should be held over the mouth and nose, and if these cannot be obtained the hand should be placed over the mouth and nose and inward breathing checked as much as possible.

Ammonia used for making ice will not burn, it will put out a fire, when confined in tanks and heated by fire it will expand and explode.

The fumes of ammonia and acids are very severe and injurious to the lungs of firemen when encountered at fires or elsewhere and will overcome them quicker than anything else. For that reason care should be taken to thoroughly ventilate any building or premises where they are escaping before entering the same.

Spray streams of water directed about (not on) in or outside of a building where there are ammonia or acid fumes will greatly lessen their deadly effect and scatter them; and should be resorted to in addition to the ventilation where there is life in danger or where the spray streams will not do unnecessary damage.

When acid in liquid form is spilled it should be covered with ashes, sand, dirt, chemical powder, salt, sawdust or similar substances to soak it up. Water should not be used directly on the acid unless there is fire which cannot be extinguished otherwise, as water only spreads the acid and makes it boil and fume a great deal more.

There are certain acids, chemicals and substances that will take fire, or create dangerous and explosive gases or fumes when mixed with water; these are generally encountered in drug store, drug house, storage warehouses, and ship fires, and great care should

be taken to avoid putting water on anything that is not on fire when working at fires in this class of buildings or ships.

Calcium carbide, when wet, is a substance that will create a dangerous and explosive gas and where possible water should not be put on the same or an open flame or light brought near it.

## ELEVENTH LESSON.

### Gas Fires.

When gas is issuing from a main, gas pipe, meter, or elsewhere, or takes fire, it should be shut off or the gas company notified immediately. If gas escaping from a pipe takes fire and the fire is endangering life and it can not be shut off, the fire can be blown out with the force of a stream of water and the gas pipe then plugged up with soap or a round piece of wood.

When a gas main in the street is leaking or on fire and it cannot be shut off immediately, it should be smothered with dirt or sand. If there is a large opening in the pipe or main and the gas is escaping from it freely or it is on fire and the flames shooting up into the air, it can be stopped readily by filling wet bags with dirt or sand and throwing them on top of the opening and then filling in with dirt around them.

In all cases of gas leaks whether there is fire or not and especially unmanageable gas leaks the gas company should be immediately notified.

Gas escaping from broken or defective pipes will often accumulate behind furrowed walls or other hollow spaces suddenly ignite from a spark of fire coming in contact with it, and cause considerable damage, and for that reason firemen should never leave any premises where gas is escaping until the same is stopped, plugged, shut off, or made safe.

When the steel or metal plates of a gasometer or gas reservoir are hot from the heat of an adjacent fire, the air about the reservoir should be cooled with spraying streams of water and when it has been cooled the stream may be directed on the reservoir, but streams of water should not be put directly on a gas reservoir when its metal plates are extremely heated as they would be liable to warp, cause the collapse of the reservoir, and disaster.

All firemen should know how to shut off gas, water and electricity when they are supplied to buildings or elsewhere and know the general location of the shut off cocks or switches of the same.

When water is escaping from a lead pipe and can not be shut off in the regular way the lead pipe can be hammered flat with the back of an axe and the leak stopped in that manner.

When gas escaping from a small service pipe has taken fire it can generally be extinguished and the leak stopped without the use of a stream by tying or wrapping a wet bag or cloth around the end of a broom and forcing it over the leak, after which it can be plugged up.

### Electric Fires.

When electric wires, switchboards, cutouts, controllers, converters, or other electric equipment are on fire the first and best thing to do is to shut off or have shut off the electric currents, then extinguish the fire with sand, chemical powder, ashes, dirt or similar substances. Water should not be used on electric fires unless there is danger of the fire extending.

In all cases of electric fires, or where there are electric wires, rails, etc., for carrying high tension electric currents for power, heat, or lighting purposes, the brass or metal nozzle should not be taken hold of when directing a stream of water as water is an excellent conductor of electricity and a stream of water coming in contact with an electric current will cause a short circuit and charge the stream.

Water has a very damaging effect on electrical appliances, whether they are charged with electricity or not and should only be used where it is impossible to

extinguish the fire by other means. Water is especially damaging to telephone, telegraph or other electrical switchboards, electric motors, dynamos, cutouts, controllers, converters, electric wires and appliances.

The large telephone, telegraph and other electrical switchboards cost thousands of dollars to put up and can be entirely ruined by a single stream of water striking them.

Small electric fires can often be put out without danger by dampening the end of a broom, a piece of rolled news or other paper and striking the fire out with it, keeping the dry end in the hand.

When fire has full possession of any electric car, either on the surface, elevated or subway systems, the streams from the nozzle or pipe should be directed up to the top and about the ceiling of the car through doors or windows. This will extinguish the fire above and permits the water to fall on and extinguish any fire below without endangering the pipeman directing the stream from receiving an electric shock in case the current is on or is turned on.

When there is a slight fire in an electric surface car the railway employees generally extinguish it with sand which they carry on the car, but sometimes a contact shoe will jam with the power rail, cause a short circuit and large sheets of flame to shoot upward and makes it necessary to cut out the car entirely from the

power; this can be done readily with a six-foot hook by reaching with it under the car and pulling out the lead wires that run from the shoe to the motor.

In all cases of dangerous electric fires or fires where there is danger from electric shock, the company supplying the electric power or current should be immediately notified to shut off the same.

When an electric wire is short circuited on a tin roof or other place, a piece of dry wood should be placed under each side of it to keep it from coming in contact with the tin and setting fire to the roof. Care should also be taken when walking or placing one's hands on the roof in such cases as it may be charged with electricity; rubber boots should invariably be worn in such cases when walking on the roof.

Fires have been caused from electric light bulbs placed in show windows and surrounded by light silks, satins or paper, by the heat from the bulbs setting fire to the materials.

Fires have also been caused by a spark from an electric light carbon dropping on various materials placed in buildings under the lights, and firemen should warn occupants of buildings or premises of these dangers whenever they are found.

### Lumber Yard Fires.

When lumber is piled on cross pieces as in lumber yards and the same takes fire and the fire extends to the interior of the pile it is impossible to reach the fire with a stream of water by directing it from a distance, as the water only enters the pile for a few inches. To properly extinguish such a fire the tip of the nozzle or pipe should be inserted at the sides of the pile between the cross pieces and the stream directed in there.

A special pipe or nozzle with a flat tip should be used for lumber yard fires so that it can be inserted easily between the layers or cross pieces and when used should only be inserted at the sides and not at the front or rear of the pile.

In addition to the above all piled lumber which has been on fire should be thoroughly overhauled to make sure that the fire has been entirely extinguished.

When lumber is piled without cross pieces the stream should be directed at the ends of the pile instead of the sides.

### Lime and Cement Fires.

When lime sheds or lime barrels are on fire or wherever lime is stored or kept water should be used

sparingly and all such fires, where possible, should be extinguished with sand, dirt, or ashes, or similar substances as water only tends to cause the lime to become heated, slack, burst the barrels and increase the fire.

Water should also be used sparingly where there are barrels or bags of cement stored or kept, as cement when once wet must be used immediately or it is useless.

#### **Awning Fires.**

When awnings are on fire, especially street awnings extending over the sidewalk, firemen should be careful if pulling down the burnt parts with hooks not to strike or let their hooks fall against plate glass or other windows, as many of such windows are easily broken but very expensive to replace. A small stream of water is usually sufficient to extinguish awning fires.

#### **Automobile Fires.**

Automobile fires are generally caused by the leakage of gasolene, kerosene, or other oil or fluid used for the purpose of propelling.

Chemical powder, sand, ashes, wet cloth, wet bags, or liquid chemical extinguishers are the best with

which to extinguish automobile fires when the fire is small, as they will smother it where water if used would have a tendency to scatter the oil or other liquid and spread the fire. If the fire is too great to extinguish with these substances water should be used, but the stream should be sprayed on the fire lightly at first for the reason that the cold water coming suddenly in contact with the hot tubes and cylinders, or the gasoline or other tank would be liable to burst or explode them.

When spraying such fire with a stream the location of the gasoline or other tank used should be ascertained and the flame and fire are driven from that direction; and after the machinery has been cooled the force of the stream may be increased and the fire extinguished entirely.

Care should be taken to extinguish every spark in such cases as a small spark coming in contact with gasoline will explode it.

Steam from the thaw hose of an engine may be used to advantage for extinguishing a small automobile fire when there is nothing else at hand or no hydrant close by.

#### **Sawdust and Shaving Chute Fires.**

When there is a fire in a sawdust or shaving chute water should be used sparingly and the sawdust or

shavings removed gradually and wet down as removed.

Sawdust when on fire will burn or smolder in the center when it is piled or in bags or heaps and requires thorough overhauling and wetting down to extinguish.

When necessary at such fires additional precaution should be taken by stretching lines of hose to protect the different floors or parts of the building.

### **Brush, Grass and Wood Fires.**

Most brush, grass and wood fires can be beaten out with the branches of trees or the ends of brooms which have been dampened or wet with water.

### **Fires Met With While Responding.**

When a company is responding to or returning from an alarm and they meet with a fire they should stop and extinguish it or leave a fireman (or two as the case may require) with enough hose connected and stretched from a hydrant to the fire, or a fireman or two to extinguish it according to the circumstances of each case. They should then proceed to the fire or return to quarters, as the case may be.

Whenever it is necessary for a company to stop and extinguish such a fire the officer in charge of the company should always notify the operator at Fire Headquarters of the fact by telegraph signal, telephone or otherwise.

## TWELFTH LESSON.

### Duties Relative to Truck Companies.

The general duties of Truck Companies or Truckmen at fires, is that of opening up or ventilating a building or parts of a building, vessel or premises, the pulling down of ceilings and partitions, cutting up floors, the raising and placing of ladders, rescuing persons in danger, assisting Engine Companies with lines of hose, and to overhaul generally.

The first and most important duty of Truck Companies or truckmen at fires is the saving of life when the same may be endangered. The next most important duty is that of quick opening up or ventilation.

By opening up or ventilation is meant the opening of windows, doors, flooring, skylights, roofs, iron shutters, iron gratings, vault covers, deadlights, etc., with as little damage and as quickly as possible for the purpose of letting the heat, smoke and gases from a fire to escape, and allow the Engine or Engine Com-

panies present to enter the building, vessel or premises with their lines of hose, unhampered, or with less difficulty.

Quick ventilation at a fire or where heat, smoke fumes or gases are confined is very important when an Engine Company or Companies are present and ready for work or there is other means provided with which to extinguish the fire, but no door, window or other parts of a building, vessel, or premises in which there is a fire or which is on fire or endangered by fire should be opened when it would have a tendency to spread the fire or endanger life or when there is no Engine Company present or no water or other means with which to extinguish the fire.

By quickly ventilating a building truckmen make it much easier for pipemen when entering such places to advance with the pipe and extinguish the fire quicker and with a great deal less punishment from heat, smoke and gases, and less damage by water.

Good ventilation often depends on the condition of the atmosphere or the direction of the wind at the time of the fire. On damp or foggy days or nights smoke will not rise as quickly as on a clear day or night and therefore makes ventilation of a building or other place more difficult. The direction in which the wind is blowing has also to be considered when ventilating a building or premises and fighting a fire. At times smoke will roll in

volumes out of the front of a building on fire, leaving the rear almost clear; at other times it will be just the reverse and again it will roll out in all directions.

Officers in charge at fires should always take notice in which direction the wind and smoke are blowing and act accordingly in extinguishing the fire.

The following rules should invariably be adhered to when ventilating a building, vessel or other place on fire:

Do not break doors or windows when they can be readily opened or removed without breaking them.

Do not break skylights when they can be readily opened or removed without breaking them.

Do not break deadlights, vaultlights, etc., when they can be readily opened or removed without breaking them.

Do not do any more damage to a building, vessel, or other place or their contents or other property than is absolutely necessary in extinguishing the fire.

The Fire Insurance Patrolmen often render valuable service in saving lives and property at fires and they have often by promptness and good work prevented fires from extending; they should, whenever possible, be given consideration and assistance at fires.

Hook and Ladder Trucks should never be brought in front of a building on fire or a hydrant, or so as to obstruct Engine or Hose Companies from stretching in their lines of hose unless it is necessary to use their aerial ladders or for other necessary purposes.

When two Truck Companies respond to a fire on the first alarm, the first due or the first to arrive should invariably be directed to open up the doors or other parts of the building or place so that the Engine Company or Companies present may enter quickly and get a stream of water on the fire. The second Truck Company due or second to arrive should invariably be directed to open up or ventilate the building above the fire. When life is in danger and for other reasons the foregoing cannot always be adhered to; the reverse direction of the companies is sometimes necessary.

No set rules can be made for rescuing or saving life at fires as the circumstances of each case has got to be considered, such as the location of the person in danger, the progress of the fire, and the number of firemen and means at hand with which to perform the rescue.

When fire is coming up an inside cellar stairway or from a floor or room into a hall or from any other place the door of the same should be shut and kept shut until the Engine or Hose Company present have their line charged or until there is water or some other means provided with which to extinguish the fire. If the heat, smoke or flame coming up or out of the open door makes it impossible to approach the door and close it by hand it can be done with a hook or axe.

If the door is entirely off its hinges or the fire is burning through and there is no immediate means with which

to extinguish the fire a door should immediately be taken off some other part of the building and placed against the opening or burning door and kept there with a hook or axe pressed against it until means is provided with which to extinguish the fire.

Fanlights over doors and other openings may be closed in a similar manner to prevent the fire from extending.

#### **Building Ventilation.**

When an entire building is charged with heat, smoke, fumes, or gases, ventilation should be made at the highest point first, which is the roof, by opening roof door, scuttle, skylights, top floor windows and the windows on each floor as descent is made, or if necessary by cutting up a portion of the roof.

By opening up the top of the building first and then the windows as descent is made it allows the greatest amount of heat, smoke, fumes or gases to escape quickly and gives the Engine, Hose and other Companies a better chance to enter the building from below and from being cut off by flame which would be the case if the building was ventilated from the lower floors first and then upward.

#### **Cellar and Sub-Cellar Ventilation.**

When only the cellar or sub-cellars of a building is charged with smoke, heat, fumes or gases, all outside

cellar doors, rear windows, vault covers, exterior elevator hoists and all other exterior openings to the cellar or sub-cellars should be opened, and if necessary the dead-light removed so as to draw the heat, smoke, fumes or gases, out of the cellar or sub-cellars and as little as possible up through the building.

For cellar or sub-cellars fires it is sometimes necessary to open up all outside doors and windows on the first or ground floor of the building in addition to the outside openings, and sometimes it is necessary to ventilate the entire building.

When holes are cut in floors for the purpose of increasing cellar or sub-cellars ventilation the holes should be cut as near to open windows as possible so as to allow the heat, smoke, fumes or gases a free escape from the building.

The success of Engine or Hose Companies when fighting fire in cellars or sub-cellars often depends on quick and good ventilation.

#### **Building, Floor and Room Ventilation.—How to Open the Windows.**

When the ventilation of an entire building or the floor of a building is necessary the windows should be pulled all the way down from the top; this method permits a freer and quicker escape for the smoke, heat, fumes, or

gases in such cases and gives firemen working on water towers a better chance to direct their streams up to the ceilings and further in on the floors.

When it is necessary to ventilate only a room or rooms the windows should be pulled down from the top three-quarter way and pushed up from the bottom one-quarter way or so as to meet the top sash after it has been pulled down.

## THIRTEENTH LESSON.

### Roof Ventilation.

When it is necessary to ventilate or open up the roof of any building the ventilation or opening up should, where possible, be made directly over the fire, that is, if the fire is traveling up a stairway, the roof door, or scuttle over the stairway should be opened or removed; if up a dumb-waiter, elevator, light, air or other shaft, the hood, skylight, or other covering over the same should be opened up or removed. By so doing the fire, heat, smoke, fumes or gases are drawn straight upward instead of spreading through the various floors or rooms and endangering the occupants of the building who may be sleeping or awake.

When it is necessary to cut up a portion of roof to ventilate any building or the top floor of any building, it

should, where possible, be cut in squares or oblongs; by so doing it makes repairing easier and much easier for the Fire Insurance men to spread their covers over the openings after the fire has been extinguished.

After a portion of roof has been cut up for ventilation purposes, if necessary, the hanging ceiling should be pushed down with a hook or an axe so as to give free ventilation.

When opening up a roof it is better to first cut the tin and roof boards through with an axe and tin cutter the size of the opening required before pulling up the boards with a hook. The reason for this is that one board cut and pulled up will often prevent the cutting of more by the smoke and heat coming through the opening and blinding the axemen.

The tin cutter or a hook sharpened on the inside should be used to strip the tin off a roof if they are at hand and the tin should be removed first before the boards are cut.

Top floor windows can often be pushed down with a hook from the roof of a building when ventilation of that floor or its rooms are necessary.

When windows cannot be reached or opened by ladders, with hooks, or in any of the usual ways and ventilation is absolutely necessary, the ball and chain should be used, but when using the same care should be taken not to strike persons at or inside windows, or let the bail fall on any one.

Fire on, or which has extended to the top floor of any building often gets in to the hanging ceiling and hollow cornices and travels along in the same to the next building; this should be guarded against by opening up the cornice and roof if necessary on each side so as to draw the fire away from the other building or buildings.

When there is a water or other tank on the roof of any building or structure, firemen should never cut away any of its supports or do anything that would cause the tank to topple over or fall, and when a tank is considered at all dangerous the firemen or persons on the floor or floors underneath the same should be notified of the fact.

When the tank is of wood, contains water, and is considered dangerous, if possible to do so, the water should be let out by opening the valve at the bottom, and if this cannot be done a hole should be bored in the side of the tank near the bottom and the water let out; an axe should never be used to cut a hole in a tank as the jarring caused by the chopping would be liable to cause the tank to fall, and besides the hole cut with an axe could not be repaired as readily as when bored with an auger.

A roof should never be stripped entirely of its roof boards, especially trussed roofs, as trusses although able to stand an enormous weight will not stand alone or

without being tied, braced, or fastened together, and when all bindings are removed they will topple over and fall.

### How To Open Locked Doors.

Doors are of various kinds and construction, such as hinged, sliding, folding, rolling, revolving and lift doors, and require different methods to open them when they are locked, bolted or fastened.

When it is necessary to open any doors at a fire they should be tried by hand first to ascertain if they are actually locked, bolted or fastened, as in many cases they are not.

When any hinged door is only locked or latched and not bolted it can be opened readily by wedging the blade of an axe between the jam and the edge of the door near the lock, latch or fastening, and prying the tongue of the lock or latch away from the catch.

When a hinged door is both locked and bolted or double bolted it can be often easily removed by wedging it off its hinges in the following manner: Insert the blade of one axe behind the hinges and drive it in with the back of another axe; the same should be done with both or all hinges, after which the door can be easily pulled away from the hinges, bolts and lock, and without any material damage.

In many cases locked or bolted doors can be easily and readily removed without damage by simply removing the hinge pins by hand or with the back of an axe and then prying the door out at the hinged side with the blade of an axe.

The hinged edge of a locked or bolted door is its weakest fastening and when the hinges are on the inside or not exposed so that any of the foregoing methods cannot be used, the door can often be easily knocked off its hinges by striking it near the hinges with the back of an axe.

In many cases of double front doors or doors having glass panels, all that is necessary to open them is to wedge the blade of an axe between them near the lock or fastening and pry them apart; this can often be done without breaking the glass or door. When there is a weather strip covering the joint between the two doors it should be pried off first before wedging the doors apart.

To open large double sliding doors, which are fastened together with a catch or bolt the blade of one axe should be wedged between them just below the catch or bolt and the catch or bolt then knocked up or loosened with blade of another axe or a hook or stick.

Single sliding doors are more difficult to open than double sliding doors and when any of this kind of doors have wood panels it is much easier to knock out a panel

by which opening a man can enter and unlock or unbolt and open the door; that is, if the fire is not too close to the door.

The doors that slide from and into pocket partitions and commonly called folding doors, are in reality sliding doors, and when there is fire in any of their pocket partitions and it is necessary to remove the folding doors the stop beads or strips that form a groove at the top and sides of the arch should be pried off first; then the iron stop at the top in the center of the arch should be knocked off, after which the doors can be pulled out of their pockets and removed readily without damage.

The metal track on the floor at the bottom should not be raised, as to do so will only bind the doors.

Revolving doors are so constructed that the arms or braces separating the doors can be dropped down by releasing or pressing a spring catch and the doors then can be folded together.

Iron or metal doors when locked or bolted on the inside can very often be lifted off their hinges by prying them up at the bottom with the blade of an axe or the point of a hook; when this cannot be done the hinges can be broken with the back of an axe or the screws or bolts of hinges cut by wedging the cutting tool or blade of an axe beneath or behind the hinge and striking it with the back of another axe, after which the door can be removed readily.

The foregoing relative to iron doors is also applicable to all iron cellar or sidewalk doors which cannot be opened in the ordinary manner.

When there is time to procure a cutting tool and mall or sledge hammer it should be used in place of axes for cutting screws or bolts on iron doors.

Padlocks on doors in most cases can be easily twisted off their fastenings by the use of the lock opener or broken by striking them with the back of an axe on the bottom of the lock, using the fastening as a back stop.

In extreme cases it is sometimes necessary to use the door opener or battering ram or the butt of a ladder as a battering ram to open doors.

When iron doors, iron gratings, deadlights or similar coverings are imbedded in sidewalks or other places of stone, concrete or cement, they can be in many cases taken up without damage by inserting the blade of an axe or cutting tool between the edge of the grating or dead-light and the cement, stone or concrete in which it is imbedded and by forcing the edge of the axe between them by striking with the back of an axe and then striking the flat side of the inserted axe the deadlight or iron grating will be forced loose and can be removed readily.

All iron or metal doors, iron gratings, deadlights or other similar obstacles on or which have been loosened from the sidewalk in front of a building for the purpose

of ventilation or otherwise should be removed to one side so as not to hamper or obstruct firemen stretching lines of hose, working or falling over the same and all openings made, especially those in front of doorways, windows or passageways whether inside or outside of a building should be guarded or protected so as to prevent firemen or others from falling into them.

#### Door and Window Frames.

Door and window frames are made either plain or boxed and all that is necessary in most cases where they are plain and fire has burned around them is to remove the casings by prying them off with the blade of an axe or pull them off with a hook, leaving the jam and the rest of the frame or sashweight pockets exposed.

When fire has burned around box casings or entered them the inside casings should be pried off and the box split down on the side and removed so as to expose the pockets.

The lath or plaster or wainscoting around window or door frames should also be removed when fire has burned through or around them.

When fire has burned around window frames and the sash cord has been burned off and has dropped back into the sashweight pockets on the side of the frame the pocket pieces should be unscrewed or the casings taken

off and the ends of the sash cord examined, as often in such cases the ends of the sash cords take fire and smoulder, and if there are any shavings in the pockets they are liable to take fire.

#### FOURTEENTH LESSON.

##### **How to Open Locked Windows.**

All windows should be opened without breaking when it is possible to do so, as falling glass is a very dangerous thing to be under and often has been the cause of severe injuries to firemen and others.

To open a latched or bolted window from outside, without breaking the glass or sash, the blade of an axe should be inserted beneath the base of the lower sash and pried upward; this will loosen the screws away from the fastening and open the window without doing any material damage.

When windows are hung on pivots at the sides of the sash the blade of an axe should be inserted at the top and the sash pried inward from the outside. Such windows are easily opened by this method without any damage.

When windows are hung on pivots at the top and bottom of the sash the blade of an axe should be inserted at the side between the edge of the sash and the window frame and pried open from there.

When there is doubt about fire existing in a building and it cannot be entered from below without breaking doors or doing considerable damage, a ladder should be raised to one of the upper floor windows and the window pried open as previously described, then entrance and examination of the premises can be made.

To remove the sash entirely from a window without breaking the glass or doing any damage the stop beads on the side of the window frame should be pried off and the sash cords loosened or cut, after which the sash can be removed easily and quickly and without damage.

### How To Break Glass.

When it is absolutely necessary to break glass windows, glass doors, glass partitions, skylights, etc., the fireman breaking the same should stand aside and strike the glass with the flat side of a hook or axe. He should never stand in front of the glass to be broken and strike at it direct, as glass will often slide outward on the weapon used for breaking and cause severe injuries to the person breaking or standing by the same.

When the glass to be broken is on an upper floor, warning should be given to those beneath before breaking the same.

Heavy plate glass should never be broken when it is possible to avoid it, as it is very expensive to replace.

### How to Open Iron Shutters.

Iron shutters when latched or bolted on the inside can be opened readily in many cases from outside by inserting the blade of an axe or the point of a hook under them and lifting them up on their hinges until the latch or catch loosens from the catch.

When lifting iron shutters up on their hinges for the purpose of opening them, whether working from fire-escapes, ladders, or a roof, care should be taken if it is found necessary to lift them entirely off their hinges not to let them fall in the street, where they would be liable to injure firemen below. Warning should always be given to firemen and persons below in such cases as iron shutters when let fall from a height often scale through the air for a considerable distance and would badly injure any one they should happen to strike.

Iron shutters when latched can sometimes be opened from the outside by striking the lower\* rivet below the latch fastening with the back of an axe; this causes the latch to jump up off the catch and the shutter to fly open.

When iron shutters or iron doors are set in a wall and cannot be opened by any of the foregoing methods the blade of an axe should be inserted between them near the latch and the latch knocked or pushed up with another axe or a piece of wood.

Iron shutters that are hung on the top floor windows of a building can sometimes be opened from the roof of the building by lifting or pulling them up or off their hinges with a hook; they can also be opened in extreme cases by breaking their hinges with the back of an axe.

When iron shutters are at a distance and cannot be reached or opened by any of the foregoing methods they can often be pulled open with a long hook or burst open with a battering ram or by using the butt end of a ladder as a battering ram.

The lock opener at times can also be used to advantage in opening iron shutters by prying between them and lifting up the latch or by lifting them off their hinges in the manner previously described with the blade of an axe.

When a building equipped with iron shutters is endangered by fire from another building or structure the iron shutters on the endangered building should be closed by beginning on a line with the fire and ascending upward until all are closed or protected by streams.

When an endangered building is not protected by iron shutters it should be protected by streams.

The large iron rolling shutters to be found mostly on business houses are generally fastened on the outside with a padlock to an iron ring or staple placed in the sidewalk just below the window or door which they

cover and by simply knocking off the padlock with the back of an axe they can be pushed up on their rollers.

Iron rolling shutters when loosened or unlocked should be pushed up from their center at the bottom so as not to wedge them.

When iron rolling shutters are fastened at the bottom on the inside the blade of an axe should be inserted and passed along the bottom of the shutter until the fastening is found when the inserted axe should be struck with the back of another axe until the fastening is out or broken, after which the shutter can be pushed up.

When it is impossible to open or remove iron rolling shutters by any of the previously described methods, square or oblong holes of the size required to enter, can be cut in them with the blade of an axe.

#### **Iron Bars and Screens.**

Iron bars are of various construction and are put on windows and doors in various ways.

When iron bars are only let into or fastened to the wooden window frame they can be easily pried or knocked off with an axe, or the sill or other part of the window frame into which they are inserted can be split by using the blade of one axe as a wedge and the back of another with which to strike it and the bars removed.

When iron bars are set into stone, brick, concrete or cement they can often be readily removed with an

axe, mall, or sledge hammer, by striking and bending each bar separately about eight or ten inches from where they are set into the stone, brick, concrete or cement; this method drives the ends of the bars out of their settings and they can be removed easily.

All of the foregoing relating to removing iron bars, can be done from either inside or outside, the fire permitting.

When iron bars or iron screens are on an upper window and require a ladder to stretch them they are more difficult to remove; in such cases two ladders should be raised close together and two or more firemen should ascend and work together in removing them as previously described.

When a person or persons are imprisoned behind iron bars on the upper floor of a building a line of hose should be run up one of the ladders and a stream of water kept in the window until the bars are removed or until it is no longer necessary or the person or persons so imprisoned are out of danger.

Persons caught or imprisoned behind iron barred or screened windows or doors should always be protected by a stream when their lives are in danger from fire; they should also be directed to keep below the stream and as near to the window or door and as close to the floor as possible.

Persons caught or imprisoned behind iron barred or screened windows or doors can often work to better advantage in removing the bars or screens than firemen can on the outside; in such cases they should be directed what to do to assist in removing them, and making their own escape.

Cutting iron or steel bars with the blade of an axe or cutting tool, hack saw or pipe cutter, would take too long when bars must be removed quickly, and such methods are not recommended.

When iron bars are deeply imbedded in stone, brick, concrete, or cement window or stone sills, and they cannot be readily removed by any of the previously described methods the sills can often be easily broken with a sledge hammer or the back of an axe and entirely removed with the bars. Such sills can also be split by placing the sharp edge of the cutting tool alongside the bars and striking with the back of an axe.

Iron bars placed anywhere and especially on upper floor windows can also be pulled out of their settings or away from their fastenings with a rope fastened to them at the center and pulled by a number of firemen.

The coarse iron wire screens which are sometimes placed on doors or windows, are generally fastened to the side of the frame with screws and can be easily pried off with the point of a hook or the blade of an axe. When they are let into the wood frame they can be cut

out at the fastening with an axe and then pulled away with a hook.

When the fire is too hot to approach a door or window covered with a wire screen a long hook should be used with which to pull the screen away.

#### **Iron Gates, Gratings and Railings.**

Iron gates erected in front of entrances to stores or places of business are generally fastened on the inside by an iron or steel bar running from their center to a fastening in the stone door sill or sidewalk and there secured with a padlock. In such cases if possible to do so a fireman should climb over the gates and knock off the padlock with the back of an axe, after which the gates can be readily opened.

When iron gratings are fastened by a chain and padlock they can often be opened quickly by striking the chain with the back of an axe so as to break a connecting link or by breaking the padlock in like manner.

### **FIFTEENTH LESSON.**

#### **Ladders, Towers, Etc.**

All officers and firemen should thoroughly familiarize themselves with the care, handling, raising and operation

of all ladders, towers, etc., and also the various uses to which they may be put. They should also know their various sizes and heights they will reach when properly raised and placed against a building, and also the number of firemen or persons that may be permitted on them with safety.

All ladders should be so placed and fastened on apparatus that they can be easily and quickly removed and used.

All ladders should be so raised, placed, and secured that they will not break or fall when the weight of firemen or persons are on them.

Water Towers, aerial or similar ladders which are secured to and raised from the frames of trucks by water pressure, worm screws, steel springs, compressed air, endless chain or other means, require demonstrative instruction to be properly understood.

The best method for raising movable ladders or ladders which can be removed from an apparatus is the hand over hand method, by both or all men working together so as to keep the ladder even as it ascends and the fireman or firemen on the butt keeping that end down and steady by placing both feet on the bottom round close to the sides and remaining in a squatting position with a firm hold of the third round from the butt. The hand over hand method should also be adhered to when lowering all movable ladders.

Movable ladders when about to be raised to the front of a building should invariably be taken lengthwise on the sidewalk and raised from there; by so doing Engine or Hose Companies are less obstructed from stretching in their lines of hose.

Before raising any ladder or water tower overhead wires should be looked for and avoided and where they interfere with the raising of ladders lengthwise from the sidewalk they should be raised from across the sidewalk and street.

Movable ladders should never be raised butt end up and all large movable ladders after having been raised and placed should be immediately secured against falling by use of guy ropes or other special fastenings as described elsewhere.

All large movable extension ladders should be equipped with guards or clasps to keep the two sections together when the top section is being extended and also stops on each side at the proper distance from the top to prevent the top section from being extended too far and doubling up like a jackknife.

Movable clasps or guides on extension ladders should always be put in place or clasped about both sections before the ladders are extended.

When hand cranks are used with which to extend ladders they should be held in firmly so as not to slip off the crank shafts, for in case they do and the lock is

not on, the top section would come down suddenly and be liable to injure those at or holding the butt of the ladder.

When a rope is used for extending ladders it should not be allowed to become entangled or caught and after the extension has been raised to the required height and the ladder lock put on, the rope should also be made taut and fastened to the two bottom rounds of the lower section, thus making the upper section doubly secure.

In all cases where a ladder of any kind is raised and placed to a gable or slanting roof or structure a fireman should be left on the top of the roof or structure to hold the ladder from sliding, unless the same is secured.

When stationary iron or frame sheds extend over a sidewalk and it is necessary to raise ladders to windows above them, the ladders can be raised to the sheds on the street side and then pulled up on the roof of the shed and the top of the ladder slid up along the front of the building to the required window, after which the butt of the ladder should be placed over a beam or so as not to break through the roof of the sheds and when necessary holes should be cut in the roof of the shed to place the butt end of the ladder in to keep it from slipping or a fireman should be placed at the butt for the same purpose.

The method of raising or sliding a ladder top end up alongside or against the wall of a building can also be done in alleys or where space is limited.

Another method to reach windows over a sidewalk shed is to raise two ladders of the same height, one on each side of the shed and stretch a rope or ladder across from each. In this case the top end of the raised ladders should extend in windows to keep them from falling.

When it is necessary to rescue a number of persons or where difficulties are encountered in rescuing any person from a single window on the upper floor of a building two ladders should be raised to the window and placed alongside each other. By this method more assistance can be given to the person or persons in danger and if a stream of water is required a line of hose can be run up one of the ladders.

When a ladder is in danger of breaking from overweight a short ladder should be held under it as a prop or support and the butt of the bending ladder held firmly to keep it from slipping; the jumping net should also be held under the person or persons on the ladder until it is secured.

When it is necessary to pull a ladder over the roof of any building it should first be raised and placed against the building that it is to be pulled over; then a rope should be lowered from the roof and the end fastened near the butt of the ladder with a bowline hitch after which the

rope should be slipped through the ladder strap hook which should be fastened just above the center of the ladder. The ladder can then be pulled up as far as the ladder strap, after which it can be bent down and pulled over on the roof by hand. A hose roller should be used to pass the rope over when hauling a ladder to the roof.

When a ladder strap is not at hand the rope can be passed through the rounds of the ladder just above the centre and the end fastened with the bowline hitch as above described.

When a stairway is burned away or in danger of falling a ladder should be used as a substitute or as a support for the stairs.

Ladders may also be used as a temporary brace for walls that are in danger of falling outward or on another building or on persons in danger.

When ladders are used against a building the walls of which are in danger of falling the ladders should be pulled out at the bottom and removed in that manner; when there is immediate danger a rope should be tied to the bottom round and the ladder pulled away.

When ascending or descending ladders or fire-escapes firemen should always face the ladder or fire-escape and also direct others to do likewise; this is the safest and best way to ascend or descend ladders or fire-escapes as a person can hold on to the rounds or sides of the ladder or fire-escape and place the ball of the foot

on the rounds. To descend with the back to a ladder or fire-escape causes the heels to catch in the rounds and throw the person descending forward and gives nothing to catch hold of or prevent falling.

When lowering ladders into cellars, sub-cellars, subways, areas, or other similar places, care should be taken to ascertain that they rest on a solid foundation before descent is made by them.

When a person or a number of persons are in great danger and about to drop or jump from the upper floor windows or roof of a building the jumping net should be used in addition to ladders to effect their escape.

When it is necessary to ventilate a building at the roof and the ladders at hand are of sufficient length to reach the roof the ventilation can often be done much quicker and better by raising the ladder to the roof and ascending by it than by going up through the next building and having to open or break locked doors, especially at night time.

#### **Other Uses of Ladders.**

Ladders may be used as battering rams to open large doors, iron shutters, or partitions that are at a distance or just out of reach, by using the butt ends to strike with,

Ladders may be used as bridges from one building to another, across air, light, or other shafts, roofs, fire-escapes, etc., by which persons or firemen may cross or escape from fire or other danger.

When a ladder is used as a bridge over a large span or when the ladder would be liable to bend and break if put on the flat it should be put on its side and firmly held in that position while persons or firemen are crossing on it.

Ladders may be used for pushing over dangerous or loose walls from an adjoining building or the roof of an adjoining building.

Aerial ladders can be used as water towers, but it is not safe to extend them when so used.

### **Hook Ladders.**

Hook ladders may be used to advantage as follows:

To get from one balcony fire-escape to another, when there are no connecting ladders.

To get over roofs from fire-escapes when there are no ladders to the roof.

To get to the peak of gable roofs.

To get from one floor to another when used similar to scaling ladders.

When hooked ladders are used to get over roofs from fire-escapes or as scaling ladders one or more firemen

should hold the ladder while the other ascends or descends.

### **Scaling Ladders.**

Climbing and rescuing persons by the use of scaling ladders and ropes must be taught and practiced to be properly understood.

## **SIXTEENTH LESSON.**

### **How to Cut Floors, Etc.**

Wood flooring should be cut alongside the beams to which it is nailed, at an angle of forty-five degrees of the grain; it is always better to cut out portions of flooring in straight lines, squares, or oblong, as it makes repairing easier, but no more should be cut out than is absolutely necessary to extinguish the fire or make proper examination.

Double wood flooring should be cut in the same manner as single flooring, except that when cutting double flooring the top flooring should be cut and pulled up with a hook first.

A sharp axe should be used when cutting flooring and by cutting alongside a beam and at an angle of forty-five degrees of the grain, the flooring is less liable to spring and the cutting is easier.

Care should always be taken when cutting floor or roof boards with an axe that the blade of the axe hits the part intended to be cut and not the handle, as when hit in the latter manner the axe handle is liable to break or pull out of the hands of the fireman.

Beams or timbers should never be cut through with an axe, especially in badly burned buildings; a saw should always be used as the jarring of an axe in cutting a beam in a badly burned building is liable to cause the collapse of a floor or the entire building.

When it is necessary to cut a beam or timber in any building, examination should be first made to see that it is not a support that would cause the floor to fall if it was cut.

All heavy jarring of a badly burned building by chopping with an axe or otherwise should be avoided.

When a floor is flooded with water holes are sometimes cut in to allow the water to run off or to prevent the water from soaking into goods on the floor, or to relieve the weight caused thereby.

Holes should never be cut in a flooded floor when the water can be readily swept down the stairs or pumped out of a window for the reason, to cut a hole in a flooded floor often allows the water to pour down through on to the floor below and greatly damage goods thereon.

When it is absolutely necessary to cut holes in a flooded floor they should invariably be made with a large

auger and bored as close to the stairway as possible, so that the water can be swept down the stairs into the street from the floor below.

Fire insurance men generally attend to the relieving or removing of water from flooded floors and cellars and the same should be left to them when they are present.

When a cellar is flooded with water it can often be relieved of the same by breaking a sewer pipe in the cellar at the base or below the water line with an axe.

Mosaic, tile, parquet or similar flooring should never be taken up when the fire can be got at quicker by pulling down the ceiling beneath. It is often much easier and better and causes less damage to pull down a piece of ceiling than to take up any of the above kinds of flooring.

When it is absolutely necessary to take any of the above kinds of flooring up it can be best done with a pick, the blade of an axe or a flat shovel or the flat end of the lock opener.

When fire has gone up between a lath and plastered partition or other hollow space the base board of same should be removed and also a part of the lath and plaster at the centre and top; if the fire has extended higher the base board and a piece of the floor adjacent to it or if necessary a part of the lath and plaster on the partition above should be removed until the end of the fire is reached and extinguished.

Base boards can be easily removed by prying them off with the blade of an axe or the point of a hook, but when they extend back of some obstacle or obstruction and cannot be removed readily they should be cut with a sharp axe.

When fire has gone up between only two joists of a partition the lath and plaster can be broken off short on each side of the same with an axe or hook, thereby causing less damage than by pulling off the plaster the full length of the lath.

Brick or stone walls are generally furrowed out with furring strips which are lathed and plastered to keep away dampness. The hollow spaces thus made vary from three quarters of an inch to two and three feet; fire often travels up these hollow spaces and leaps from floor to floor unseen and rapidly spreads throughout an entire building. To guard against this, or wherever there is doubt, small openings should be made in these hollow spaces both above and below where a fire has entered or is suspected of having entered and an examination made as to whether the fire has extended upward or dropped down beneath.

Whenever doubt exists or indications warrant it, all hollow spaces above and beneath which there has been fire should be opened as they are liable to fill up with gases from the fire or from leaky gas pipes which sud-

denly from a single spark would cause considerable damage.

By feeling hollow spaces with the hand the location of a fire can often be ascertained, by the heat of the fire, when no outside indications exist.

When firemen are stripping partitions or other parts of a building of the burnt covering such as lath and plaster, boarding, etc., the posts, girders, columns, joists, uprights, studs or other main supports should never be knocked out of place or removed, as the very weight and safety of a floor or building may depend upon them for support. The proper way is to strip off only the burnt lath and plaster or other covering that may be necessary.

When the posts, or columns and girders of a burned out building are intact, straight and level, it is generally an indication that the building is safe to enter.

When fire has burned around pipe holes or tubes a small opening in the ceiling should be made around them and an examination made, as fire will often follow pipes and tubes for a considerable distance.

Corrugated iron or metal ceilings are often very difficult to remove with hooks, but are easily removed by an instrument specially made for that purpose.

After an opening has been made in a metal ceiling with a hook the flat end of the instrument should be inserted to its full length into the opening and then used

as a pry against the floor by pulling down on handle; this forces the hardest nailed ceilings off.

This instrument can also be used with similar effect on lath and plastered or boarded ceilings or partitions and will strip them much easier and quicker than a hook or axe.

When fire has entered a hanging ceiling and it does not show from the floor above it can be readily located and its extent ascertained by simply pulling away the lath and plaster or other covering just above the ceiling that surrounds the approach to the scuttle and roof. From this point the entire interior of a hanging ceiling is exposed and any fire therein can be extinguished with a stream from there.

When firemen are pulling down ceilings, sidewalls, partitions, or other parts of a building they should avoid as much as possible pulling down gas pipes, water pipes, or electric wires or causing leaks or short circuits.

When firemen are pulling down ceilings, cornices, or any other burned or damaged material they should never stand directly under the same or in such a position that the material to be pulled down will fall on them and they should also warn all persons of the danger of passing under the same.

When it is necessary to remove a large roof cornice, it is better, where possible, to pull it over on the roof, and when not possible it should be pulled down with a

rope stretched to the opposite side of the street and no person should be allowed to stand or pass under it while it is being pulled down.

Large roof cornices are generally fastened on the top by pieces of strap iron screwed or nailed to the roof boards and soldered to the cornice; on the bottom they are set into or anchored into the wall by similar pieces of strap iron. When roof cornices are fastened in this manner and pulled down they generally take with them the whole front of the top floor wall of the building, and for that reason should be pulled down from a distance or over on the roof.

### **Overhauling.**

When pulling down burned material or overhauling the same, firemen should not scatter it about or put it on material or goods that have not been on fire; all burned material which is liable to cause damage to other property should be removed, but no article or material of value, such as clothing, etc., no matter how much burned or damaged, should be thrown out of a building, as all such articles and material are to be itemized by the Fire Insurance Patrolmen in the loss and claim.

Firemen when throwing burned or other material out of a building should always give warning to those

beneath before throwing out the same; they should also avoid throwing burned or other material on awnings or down elevator, light, air, dumb-waiter or other shafts where firemen are working or persons are liable to put out their heads, so as not to break windows, skylights, or cause injury or damage to persons or property.

Feathers or other similar material should never be thrown out of a building. They should be placed in a sheet or other such article and tied up so as to prevent them from becoming scattered about.

### Wall Breaching.

Brick walls are breached at fires so that the centre or body of the fire may be exposed and streams of water sent to it direct.

Breaching the walls of a building that is on fire is generally done from the roof or floor of an adjoining building, but should never be done from any floor of an adjoining building unless at least two lines of hose are stretched to the same charged and ready to send their streams into the breach or opening as soon as it is made so as to prevent the fire from extending through it into the adjoining building.

Picks should be used with which to breach a brick wall and the bricks pried out as fast as they are loosened, but the opening should not be made too large at

first, if it is made from an adjoining floor, until the action of the fire is ascertained.

It is much easier to breach a brick wall through a chimney, as it is less solid there owing to the flue, but it is not always advisable to do so, as a chimney acts as a brace to a wall and breaching of wall must be done according to the circumstances of each case.

The battering ram is sometimes used for the purpose of breaching walls, but it is not always advisable owing to the fact that the jarring caused by it is liable to collapse a floor or an entire building if the fire is extensive.

Plastered walls, partitions, etc., may also be breached where it is necessary to rescue persons from danger or to get a stream of water directly on the fire; in such cases it can be done with axes and hook.

## SEVENTEENTH LESSON.

### Unmanageable Fires.

The leveling and destroying of buildings by the use of explosives is the last resort to stop the progress of a fire and should be done only by competent men who are familiar with the handling, care, use, and nature of explosives, and only when the fire has become unmanageable or beyond control of a Fire Department, and the Chief or Acting Chief of that Department so orders or directs.

Explosives when used for the purpose of leveling or destroying buildings should be stored in an isolated place and be of a kind that will not emit or throw off a black or combustible smoke when discharged, as such kinds would only tend to spread the fire or hamper the Sappers and Miners' Corps or firemen at work, by obstructing their view.

When explosives are used for leveling or destroying buildings or structures they should be inserted or placed at the base of posts, columns, piers, or other inside supports of the building or structure to be leveled or destroyed and exploded there. By blowing down the inside supports of a building or structure the collapse of the entire building or structure generally follows.

Electricity should be invariably used for discharging explosives when the same is resorted to by the Corps of Sappers and Miners or firemen, and only such buildings as are actually on fire or about to take fire should be leveled.

The object in leveling buildings in such cases is to get them down to where they can be easily reached with streams of water.

When possible all fires in heating apparatus, boilers, stoves, etc., should be extinguished in buildings before they are leveled or destroyed.

After the earthquake which caused the City of San Francisco to take fire, the water system was rendered

inoperative by the breaking of the water mains and the Fire Department made almost useless; black or giant powder was then brought into use by inexperienced persons, with hope of leveling buildings and arresting the progress of the fire. This only increased the flames, for, wherever it was exploded it threw off a black smoke which ignited all wood and other combustible material with which it came in contact.

Stick dynamite and gun cotton were afterward used with success and it was proved that smokeless explosives are a valuable aid with which to fight fire or stop its progress when it has got beyond control of the regular means of extinguishment.

It was also proven at the San Francisco fire that buildings constructed with steel frames riveted together on each floor were better left standing and only that class of buildings built of frame, brick or stone and having wooden beams, posts, girders, columns, floors, partitions, etc., should be leveled or destroyed by the use of explosives.

### Water and Combustibles.

They should know the effect fire has on the various materials and substances, and also the effect water has on them, especially when they are on fire or heated.

When water is thrown on wrought or rolled iron or steel or similar metal that has been heated to a certain degree it will cause such metal to warp and twist.

Water thrown on cast iron, cast steel or similar metal that has been heated to a certain degree will cause such metal to crack and break.

Water thrown on granite, marble or similar stone that has been heated to a certain degree will cause such stone to burst.

Water thrown on brown or similar sand stone that has been heated to a certain degree will cause such stone to break and crumble.

Water thrown on bricks whether they are heated or not will be greatly absorbed by the bricks, and when thrown on brick walls when they are exceedingly hot will cause the bricks to swell and the walls to crack or bulge.

Some bricks will absorb less water than others, according to their hardness or composition.

Taken as a whole brick is the best known fireproof material that will stand the counter effects of fire, heat and water.

Water thrown on cotton, wool, jute, hemp, oakum, rags, paper, hay, straw or similar materials when they are packed or baled and whether they are on fire or not will cause them to expand and increase in weight.

Hay, straw and paper when packed or baled will only burn on the outside when on fire and can be readily

extinguished without opening the bales; to open them when they are on fire only spreads the fire.

Cotton, jute, oakum, rags, wool, hemp, sawdust and similar materials when packed or baled or in heaps will often burn from the outside toward the centre and are required to be opened or thoroughly overhauled to extinguish fire in them.

No baled material when on fire should be opened in the hold of a ship or in a building; it should first be wet down and then removed to the deck, dock, yard or street, as the case may be, and if necessary opened there. The opening of a single bale of such material when on fire in the hold of a ship or a building will often spread the fire to other bales or materials or drive everybody out by its smoke.

Water thrown on certain chemicals, acids, and substances will cause fire or create gases which will ignite or explode when brought in contact with flames. These chemicals, acids and substances are generally met with in drug houses, drug stores, storage warehouses or ships and firemen should be particularly careful when working at fires in such places.

Calcium carbide when wet is one of the substances that will create a very explosive gas known as acetylene gas and any open flame brought near the same will cause an explosion.

Wood is one of the most combustible of materials and when thin or light is rapidly consumed by fire, but when heavy as in timbers, posts, girders, etc., will often burn for hours, resisting the counter effects of fire, heat and water much longer and in a far superior manner to steel or iron, where the latter is not encased in stone, brick or concrete or other fireproof material.

Water has no visible effect on wood except to swell it slightly.

Water thrown on nitro glycerine, gun cotton, forcite, dynamite or similar explosive compounds when they are on fire or burning will invariably cause an explosion. Such substances should invariably be allowed to burn out and the surrounding property protected.

When any of the foregoing substances are on fire and confined so as the gases arising from combustion cannot escape quickly they will cause an explosion.

A sudden shock also will often cause an explosion of any of the foregoing named substances when they are on fire and sometimes when they are not on fire.

Salt water or sea water when thrown on silks, satins, furs, cottons, laces or similar materials will render them useless. It will also injure hose, rust or corrode iron and steel and most metals and all hose, pumps, tubes, boilers, or other parts of an engine through which salt water has passed should be washed out thoroughly with fresh water.

### The Signal Code.

All firemen should know how alarms of fire are transmitted and received, and also how to use the Morse key when sending second or greater alarms, special calls or other signals that are used for fire department purposes. They should also always have their fire alarm box keys with them no matter whether they are on or off duty, and the keys should always be kept in good order and ready for immediate use.

They should also know the telephone numbers of the Fire, Police and Water Departments, and how to use the telephone to call either department in case of fire, riot, break in a water main, or for an ambulance or any necessary purpose.

All firemen should thoroughly familiarize themselves with the Fire Department Signal Code, assignments and instructions therewith. • The importance of correctly counting signals and alarms that are received cannot be too strongly impressed on the minds of firemen.

It will sometimes occur that a second or greater alarm will be received from a different station than the first alarm and in such cases care should be taken to count the station and ascertain if the company is assigned before responding.

Every fireman should know the shortest and safest routes to all alarm stations to which their Company is assigned.

Every fireman should know how to tell by the automatic dials placed on the outside of buildings which floor automatic alarms are sounded from on their arrival at a building in response to such alarms.

### Water Supply.

Firemen should be familiar with and know how the water supply system for extinguishing fires is arranged and distributed and what to do and who to notify in case of any breakage of the system. They should also know how to properly open or close a hydrant and also know how the various hydrants are constructed, and they should also learn not to waste water.

The care of fire hydrants is an important matter and should never be neglected, especially in winter.

Firemen should know the pumping capacity of the various size engines so as to be able to tell whether it would be necessary to siamese or work in relay when pumping water to heights, elevations, or long distances.

They should also know that poor or low pressure on a line or at the nozzle is sometimes caused by an insufficient water supply, the hydrant not being opened fully, stones, sand or other substances or material in the barrel of the hydrant that chokes the water off at the nipple or enters the engine's strainer and chokes the water there,

or stones, sand, etc., placed in the top of the barrel of a hydrant that prevents the turning of the valve stem.

Eels or other fish or substances or material will sometimes lodge in the strainer or be forced through it and the pump valves and lodge in the tip of a nozzle and choke off a stream.

Firemen should know the location of every hydrant in the district where they respond on first alarms and familiarize themselves with every building in the district. They should know the nature of the contents of each building and also have in their company quarters simple and plain drawings showing the location of all entrances, exits, stairways, fire-escapes, elevators, dumb-waiter, air, light or other shafts, trap doors or other openings, and also a brief description of each building and the nature of its contents.

Firemen should always remember that the fire boats are a very important branch of the service, both for fires on the water and along the piers, docks or shore front or near the same.

At large fires one large stream directed on the body of the fire is better than a dozen small streams scattered about, and where there is extreme heat or heat exceeding 2,200 degrees water itself will separate and burn. Therefore, small streams on large fires only tend to create a draught and make the fire burn with greater rapidity.

The faster water is pumped, discharged or forced through hose the more resistance and back pressure it will encounter, which simply means the greater the pressure of water on a line of hose the greater the resistance. Therefore, hose, nozzles, etc., should be regulated to suit the pressure or the pressure regulated to suit the hose or nozzle to get the best results.

Firemen should familiarize themselves with the construction of various kinds of heating apparatus, such as stoves, boilers, furnaces, etc., and also the flues, pipes, etc., leading to and from the same, so as to know what to do in cases of emergency or when any of them are liable to burst or explode, to prevent the same.

## EIGHTEENTH LESSON.

### Dangers To Be Avoided.

When entering a building or other place that is charged with smoke or in darkness, firemen should try and remember the direction by which they entered and the different doorways they passed through so as to know the exits in case of need.

If a line of hose is stretched when entering a building it can generally be followed out in case of necessity.

When entering a dark or smoke charged building or place, firemen should always feel their way in front of

them so as to guard against falling or walking into well holes, trap doors, elevator shafts, hoistways or similar places. The same precaution should be taken when on a roof so as not to walk off the roof or into open shafts, and when there is snow on a roof, care should be taken to avoid walking into skylights that are on a level with the roof and covered with snow.

When a building or part of a building becomes heavily charged with smoke, heat and gases, backdraughts will sometimes occur which will drive firemen working within away from the fire or out of the building. These backdraughts come from various causes and when firemen see, feel or suspect the coming of a backdraught while working at a fire they should keep as close to the floor as possible so as to avoid the full impact of it. Backdraughts generally come suddenly and only last a few seconds, some of their causes are as follows:

Smoke, heat and gases accumulating in a building or part of a building, arising rapidly and finding no outlet above, rushes back to the first outlet below.

The gas accumulating from fire becoming suddenly ignited.

The opening of a window or door above the fire which by so doing causes an inward draught of air.

The opening of pipes or nozzles or streams directed from opposite directions.

Firemen should avoid following too closely to one apparatus with another when proceeding to or returning from alarms of fire; there should be at least one hundred feet between each apparatus in such cases.

They should also avoid getting caught between the apparatus and the jam of the door when leaving or backing the apparatus into quarters.

They should avoid getting caught or crushed between the apparatus and other vehicles or obstacles while going to or returning from alarms for fire by always keeping a sharp lookout for collisions, especially when putting on their coats, hats or boots.

When firemen are working in courts or alleys at fires of any magnitude, they should provide means of escape beforehand if possible, by having the doors or windows of the building on the opposite side of the court or alley from the fire so opened that they may readily enter in case the wall threatens to fall.

The officer in charge at a fire of any magnitude should always, where possible, guard against firemen being injured by falling walls, by stationing competent officers or firemen on the roof of adjoining buildings or at such positions on the sidewalk, street or elsewhere that they will be able to detect any deviation of such walls from their plumb line or any other danger they may notice, and give warning to those in danger.

When explosions occur which throw walls firemen cannot always receive warning in time, and for that reason they should be on the alert and provide a means of escape in case of any threatened danger.

Walls may be considered dangerous when cracks appear in them, when they lose their plumb line, sway to and fro, when the fire within the building renders it impossible to enter or when the posts, columns, girders, floor beams or other inside supports or ties have been burned away, or are out of plumb or missing, or where the floors are sagged and the walls bulged out, or where the foundations are undermined by water or when there is heavy machinery or other heavy articles, material, or substances on badly burned floors.

When firemen are cutting out window frames there is danger of the stone lintels above the frames or the stone sills below becoming loosened and falling out.

When there is considerable baled material such as cotton, paper, wool, hay, straw, jute, oakum, hemp, rags, etc., on badly burned floors and the same is soaked with water there is danger of the floors or building falling from overweight or from bulging of the walls by expansion of the water soaked material.

Firemen should avoid, when possible, walking or standing under elevator or other shafts when fire is in the upper part of a building, and especially when the fire is around the drum or cables of an elevator cage, as the

cables will often snap from the heat of the fire and cause the cage to fall.

Firemen should avoid overcrowding on a badly burned stairway, especially when the stair supports or fastenings have been loosened or burned away; in such cases a ladder should be placed on top of the stairway and used to ascend or descend by.

Firemen should avoid holding the metal nozzle when directing a stream where there are electric wires or electric appliances that would be liable to cause an electric shock. In such cases the hose back of the nozzle should be taken hold of and if at hand rubber gloves worn.

Firemen should avoid explosions of gas by not taking lanterns or open lights in or near places where gas is escaping or the same has accumulated.

Firemen should avoid spreading their legs apart when lifting a heavy weight, as by so doing rupture is often caused; when lifting a heavy weight the feet should be placed near or close together.

Firemen should avoid ascending or descending ladders until they are properly placed and secured.

Firemen should change their wet clothes for dry ones as soon as possible after returning from an alarm of fire.

**NINETEENTH LESSON.****Theatre Details.**

When firemen are detailed to theatres or similar places they should be on the alert to guard against fire or panic and particularly to see that all exit doors or gates open outward and that they are not locked or bolted when a number of persons are within the building. They should also see that all doors or other openings in the proscenium arch, both below and above the stage, are kept closed and that they are fire-proof; that all aisles, passageways, exits and stairways are free from obstructions of any kind that would cause people to fall in case of panic.

If an unmanageable fire should occur on or under the stage of any theatre or anywhere back of the proscenium arch, the firemen present should immediately send in the fire alarm from the building fire alarm box, then see that the fire-proof curtain is quickly and properly lowered, all skylights over the stage opened by cutting or loosening the ropes attached to the same, that the alarm is also sent out from the nearest street fire alarm box and above all things prevent panic.

The lowering of the fire-proof curtain and the opening of the skylights over the stage is very important at unmanageable stage fires, as the curtain prevents the flame, heat, smoke and gases from reaching the audience, and

by opening the skylights they are drawn upward through the openings.

After the Iroquois Theatre fire at Chicago, the Austrian Government had a model fire-proof theatre built at Vienna; it was patterned after the usual theatre building and was constructed of iron and concrete. About forty fire tests were made on the stage and old scenery soaked with kerosene was used; the results of the tests proved that the most effective means of reducing the danger from theatre fires is to provide means of escape for the dangerous gases and smoke by opening the skylights or ventilators placed on the roof over the stage. Such ventilators or skylights should be opened at the breaking out of the fire and should be done automatically or by hand, the more of them opened the more certain is the safety of the public and the less danger of the fire extending.

Asbestos curtains will stand considerable heat, but when heated by fire and struck with a stream of water they will crumble.

## TWENTIETH LESSON.

### The Care of Apparatus, Tools, Implements, Etc.

Every Fire Department apparatus and its equipment, whether spare or regular, should be thoroughly and reg-

ularly examined for defects, especially after they have been used, and if any defects are found they should be remedied as soon as possible.

No parts of an apparatus or the implements or tools thereon, such as movable bolts, pins, swivels, couplings, rods, ladder locks, springs, etc., that require to be moved or withdrawn for the purpose of using or operating any apparatus or parts of an apparatus or implements should be painted, but should be kept clean and well oiled or greased so that they may be moved or withdrawn readily.

The axle arms, wheels and springs of all apparatus should be given particular and frequent attention to guard against any flaws in the same, as on the running gear often depends the safety of firemen when proceeding to or returning from a fire.

Hose should never be put in a hose tower where there are steam pipes. The steam will cause the hose to become brittle. Natural heat is the best with which to dry hose.

Hose should be put loosely on hose wagons and not packed down; the folds should also be frequently changed. When hose is packed down on a wagon and not changed frequently the folds will cause a kink at the bends and often burst there or interfere with the pressure of water on the line.

Hose should not be put on wagons when twisted or when wet, especially canvas or fabric hose, as it will mildew if put on when wet.

When hose is being put on a hose wagon or reel the couplings should be examined and a hose washer put in each coupling if required. The threads of all couplings should be thoroughly cleansed of all dirt or sand and a slight coat of lubricating oil put on them, but no oil should be allowed to touch the hose, as it will cause it to become brittle.

Cold and frost effects rubber and makes it brittle. That is one of the reasons why more hose bursts in the winter months than at any other time.

Hose should not be allowed to remain kinked when charged with water.

All hose, pipes, nozzles, siamese or other connections should be examined and tried regularly to see if their threads are in good order and that their swivels work easily.

Nozzles, pipes, couplings, etc., should not be allowed to fall, as a slight dent in them is liable to render them unfit for use, or in the case of pipes to throw a spray stream instead of a direct one.

# HIGH PRESSURE FACTS

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## Results of Forty Tests.

Here are some important facts and figures relative to high pressure operations. The Fire and Water Department officials have held tests to ascertain the pressure of water that can be obtained at certain distances from the hydrant. The figures given are correct and should be preserved by firemen for reference. Forty separate tests have been made with the following results:

### Two and One-Half Inch Hose.

#### Using Inch and a Half Nozzle.

No. 1—At hydrant pressure 197 pounds; at 1,000 feet, 21 pounds; gallons per minute, 305.

No. 2—Hydrant, 125 pounds; 1,000 feet, 10 pounds; gallons per minute, 211.

No. 3—Hydrant, 125 pounds; 900 feet, 14 pounds; gallons per minute, 250.

No. 4—Hydrant, 197 pounds; 900 feet, 24 pounds; gallons per minute, 327.

No. 5—Hydrant, 197 pounds; 800 feet, 27 pounds;  
gallons per minute, 347.

No. 6—Hydrant, 125 pounds; 800 feet, 17 pounds;  
gallons per minute, 275.

No. 7—Hydrant, 125 pounds; 700 feet, 19 pounds;  
gallons per minute, 290.

No. 8—Hydrant, 199 pounds; 700 feet, 30 pounds;  
gallons per minute, 365.

No. 9—Hydrant, 125 pounds; 600 feet, 22 pounds;  
gallons per minute, 313.

No. 10—Hydrant, 200 pounds; 600 feet, 35 pounds;  
gallons per minute, 394.

No. 11—Hydrant, 125 pounds 500 feet, 25 pounds;  
gallons per minute, 333.

No. 12—Hydrant, 197 pounds; 500 feet, 41 pounds;  
gallons per minute, 427.

No. 13—Hydrant, 125 pounds; 400 feet, 33 pounds;  
gallons per minute, 383.

No. 14—Hydrant, 197 pounds; 400 feet, 49 pounds;  
gallons per minute, 467.

No. 15—Hydrant, 200 pounds; 300 feet, 62 pounds;  
gallons per minute, 525.

No. 16—Hydrant, 125 pounds; 300 feet, 39 pounds;  
gallons per minute, 416.

No. 17—Hydrant, 125 pounds; 200 feet, 52 pounds;  
gallons per minute, 520.

No. 18—Hydrant, 200 pounds; 200 feet, 80 pounds;  
gallons per minute, 596.

No. 19—Hydrant, 195 pounds; 100 feet, 110 pounds;  
gallons per minute, 699.

No. 20—Hydrant, 125 pounds; 100 feet, 74 pounds;  
gallons per minute, 574.

### Three Inch Hose.

#### Inch and Three-Quarter Nozzle.

No. 21—Hydrant, 125 pounds; 1,000 feet, 19 pounds;  
gallons per minute, 396.

• No. 22—Hydrant, 200 pounds; 1,000 feet, 28 pounds;  
gallons per minute, 481.

No. 23—Hydrant, 200 pounds; 900 feet, 24 pounds;  
gallons per minute, 530.

No. 24—Hydrant, 125 pounds; 900 feet, 20 pounds;  
gallons per minute, 407.

No. 25—Hydrant, 125 pounds; 800 feet, 23 pounds;  
gallons per minute, 436.

No. 26—Hydrant, 200 pounds; 800 feet, 35 pounds;  
gallons per minute, 538.

No. 27—Hydrant, 200 pounds; 700 feet, 40 pounds;  
gallons per minute, 575.

No. 28—Hydrant, 125 pounds; 700 feet, 25 pounds;  
gallons per minute, 455.

No. 29—Hydrant, 125 pounds; 600 feet, 28 pounds;  
gallons per minute, 481.

No. 30—Hydrant, 200 pounds; 600 feet, 46 pounds;  
gallons per minute, 617.

No. 31—Hydrant, 197 pounds; 500 feet, 62 pounds;  
gallons per minute, 716.

No. 32—Hydrant, 125 pounds; 500 feet, 33 pounds;  
gallons per minute, 522.

No. 33—Hydrant, 125 pounds; 400 feet, 39 pounds;  
gallons per minute, 568.

No. 34—Hydrant, 197 pounds; 400 feet, 65 pounds;  
gallons per minute, 732.

No. 35—Hydrant, 197 pounds; 300 feet, 76 pounds;  
gallons per minute, 792.

No. 36—Hydrant, 125 pounds; 300 feet, 50 pounds;  
gallons per minute, 643.

No. 37—Hydrant, 120 pounds; 200 feet, 60 pounds;  
gallons per minute, 704.

No. 38—Hydrant, 200 pounds; 200 feet, 97 pounds;  
gallons per minute, 895.

No. 39—Hydrant, 200 pounds; 100 feet, 125 pounds;  
gallons per minute, 1,016.

No. 40—Hydrant, 122 pounds; 100 feet, 82 pounds;  
gallons per minute, 823.

**BUILDINGS OF THE FIRE DEPARTMENT.****Boroughs of Manhattan, The Bronx and Richmond.**

Headquarters—Office of Commissioner. Bureaus—  
Chief of Department, Inspector of Combustibles, Fire Marshal, Violations and Auxiliary Fire Appliances, Building Superintendent, Fire Alarm Telegraph (Central Office), Medical Officers, Store House, School of Instruction and Drill Ground, 157-159 East 67th St.

Hospital and Training Stables, 133-135 West 99th St.

**Divisions.****No.**

- 1 100-102 Duane St. (Quarters Engine Co. 7).
- 2 185 Lafayette St.
- 3 113-115 West 33d St. (Quarters Hook and Ladder Co. 24).
- 4 205 West 77th St. (Quarters Hook and Ladder Co. 25).
- 5 221 East 75th St. (Quarters Engine Co. 44).
- 6 6 Hancock Place.
- 7 3134-3136 Park Ave. (Quarters Engine Co. 71).
- 8 Castleton Ave., between Barker and Taylor Sts., Richmond. Marine, Battery Park (Quarters Engine Co. 57).

**Battalions.**

No.

- 1 113 Liberty St. (Quarters Engine Co. 6).
- 2 87-91 Lafayette St. (Quarters Engine Co. 31).
- 3 157-159 Mercer St. (Quarters Hook and Ladder Co. 20).
- 4 84 Attorney St. (Quarters Hook and Ladder Co. 18).
- 5 278-284 Spring St. (Quarters Engine Co. 30).
- 6 108 East 13th St. (Quarters Hook and Ladder Co. 3).
- 7 243 West 20th St. (Quarters Hook and Ladder Co. 12).
- 8 126 East 50th St.
- 9 788 Eighth Ave. (Quarters Hook and Ladder Co. 4).
- 10 159 East 85th St. (Quarters Engine Co. 22).
- 11 105-107 West 102d St. (Quarters Engine Co. 76).
- 12 120 East 125th St. (Quarters Hook and Ladder Co. 14).
- 13 1907 Amsterdam Ave. (Quarters Engine Co. 38).
- 14 341-343 East 143d St. (Quarters Hook and Ladder Co. 17).
- 15 3431-3433 White Plains Ave. (Quarters Engine Co. 62).
- 16 250 West 143d St.
- 17 491 East 166th St. (Quarters Engine Co. 50).

No.

- 18 2504 Webster Ave.
- 19 Bloomfield St. & N. River.
- 20 1215 Intervale Ave. (Quarters Engine Co. 82).
- 21 481 Van Duzer St., Stapleton, S. I.
- 22 51 Cottage Pl., Port Richmond (Quarters Engine Co. 207).
- 23
- 24
- 25
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etc.

#### **Engine Companies.**

- 1 165 West 29th St.
- 2 530 West 43d St.
- 3 417 West 17th St.
- 4 119 Maiden Lane.
- 5 340 East 14th St.
- 6 113 Liberty St.
- 7 100-102 Duane St.
- 8 165 East 51st St.
- 9 55 East Broadway.
- 10 8 Stone St.

## No.

- 11 437 East Houston St.
- 12 261 William St.
- 13 99 Wooster St.
- 14 14 East 18th St.
- 15 269 Henry St.
- 16 223 East 25th St.
- 17 91 Ludlow St.
- 18 132 West 10th St. (one High Pressure Ho  
Wagon and one Engine and Tender).
- 19 335 West 25th St.
- 20 243 Lafayette St. (Searchlight Eng. Co. 1, Hi  
Pressure Hose Co.).
- 21 216 East 40th St.
- 22 159 East 85th St.
- 23 215 West 85th St.
- 24 78 Morton St.
- 25 342 Fifth St.
- 26 220 West 37th St.
- 27 173 Franklin St. (High Pressure Hose Co.).
- 28 604 East 11th St.
- 29 160 Chambers St.
- 30 278-284 Spring St. (one High Pressure Ho  
Wagon and one Engine and Tender).
- 31 87-91 Lafayette St. (Water Tower No. 1).
- 32 49 Beekman St.
- 33 42-44 Great Jones St.

## No.

- 34 440 West 33d St.
- 35 223 East 119th St.'
- 36 1849 Park Ave.
- 37 83 Lawrence St., through to Amsterdam Ave. and  
128th St.
- 38 1907 Amsterdam Ave.
- 39 157 East 67th St.
- 40 153 West 68th St.
- 41 330 East 150th St. (Bronx).
- 42 1192 Fulton Ave. (Bronx).
- 43 Sedgwick Ave., opp Burnside Ave. (Bronx).
- 44 221 East 75th St.
- 45 925 East 177th St. (Bronx).
- 46 451 East 176th St. (Bronx).
- 47 502 West 113th St.
- 48 2504 Webster Ave. (Bronx).
- 49 Blackwell's Island.
- 50 491 East 166th St. (Bronx).
- 52 Riverdale Ave., near Spuyten Duyvil Parkway  
(Bronx).
- 53 175 East 104th St.
- 54 304 West 47th St.
- 55 363 Broome St.
- 56 120 West 83d St.
- 57 (Floating Engine), Battery Park.
- 58 81 West 115th St.

## No.

- 59 180 West 137th St.
- 60 352 East 137th St. (Bronx).
- 61 1518 Williamsbridge Road (Bronx).
- 62 3431-3433 White Plains Road (Bronx).
- 63 4109 White Plains Ave. (Bronx).
- 64 1214 Castle Hill Ave.
- 65 33 West 43d St.
- 66 Floating Engine, foot Grand St., East River, P  
No. 55.
- 67 518 West 170th St.
- 68 1080 Ogden Ave. (Bronx).
- 69 243 East 233d St. (Bronx).
- 70 169 Scofield St., City Island (Bronx).
- 71 3134-3136 Park Ave. (Bronx).
- 72 22 East 12th St. (High Pressure Hose Co.).
- 73 655 Prospect Ave. (Bronx).
- 74 207 West 77th St.
- 75 2085 Jerome Ave. (Bronx).
- 76 105-107 West 102d St.
- 77 Floating Engine detailed foot Main St. (Brooklyn).
- 78 Floating Engine, foot of 99th St. and Harlem River.
- 79 2928 Briggs Ave. (Bronx).
- 80 503-505 West 139th St.
- 81 3045 Albany Road (Bronx).

## No.

- 82 1215 Intervale Ave. (Bronx).
- 83 618 East 138th St. (Bronx).
- 84 513 West 161st St.
- 85 Floating Engine, foot of 35th St. and North River.
- 86 Foot of Bloomfield St.
- 87 Floating Engine, foot of 132d St., Harlem River.
- 88 2225 Belmont Ave. (Bronx).
- 89 1799 First Ave.
- 90 1841 White Plains Rd.
- 91
- 92
- 93
- 94
- 95
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**Hook and Ladder Companies.**

- 1 104 Duane St.
- 2 126 East 50th St.
- 3 108 East 13th St. (Water Tower No. 2).
- 4 788 Eighth Ave.
- 5 102 Charles St.

## No.

- 6 77 Canal St.
- 7 217 East 28th St.
- 8 North Moore and Varick Sts.
- 9 209 Elizabeth St.
- 10 191 Fulton St.
- 11 742 Fifth St.
- 12 243 West 20th St.
- 13 159 East 87th St.
- 14 120 East 125th St.
- 15 Old Slip, between Water and Front Sts.
- 16 159 East 67th St.
- 17 341-343 East 143d St. (Bronx).
- 18 84 Attorney St.
- 19 886 Forest Ave. (Bronx).
- 20 155-157 Mercer St.
- 21 432 West 36th St.
- 22 766 Amsterdam Ave.
- 23 504 West 140th St.
- 24 113-115 West 33d St. (Water Tower No Searchlight No. 2).
- 25 205 West 77th St.
- 26 52-54 East 114th St.
- 27 453 East 176th St. (Bronx).
- 28 248-250 West 143d St.
- 29 620 East 138th St. (Bronx).
- 30 104 West 135th St.

No.

- 31 1213 Intervale Ave. (Bronx).
- 32 489 East 166th St. (Bronx).
- 33 2083 Jerome Ave. (Bronx).
- 34 515 West 161st St.
- 35 142-144 West 63d St.
- 36 Sedgwick Ave., opp. Burnside Ave. (Bronx).
- 37 2930 Briggs Ave. (Bronx).
- 38 2223 Belmont Ave. (Bronx).
- 39 1799 First Ave.
- 40 6 Hancock Pl.
- 41 1843 White Plains Rd.
- 42
- 43
- 44
- 45
- 46
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- 48
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#### BOROUGH OF RICHMOND.

##### Engine Companies.

- 51 Floating Engine, St. George.
- 201 190 Butler Ave., Tottenville.
- 202 1212 New York Ave., Rosebank.

No.

- 203 72 Broad St., Stapleton.
- 204 44 Van Duzer, Tompkinsville.
- 205 223 Jersey St., New Brighton.
- 206 412 Broadway, West New Brighton.
- 207 51 Cottage Pl., Port Richmond.
- 208 22 Central Ave., Mariner's Harbor.
- 209
- 210
- 211
- 213
- 214
- 215

#### **South Beach Hose Company.**

- 1 Seaside Boul., between Ocean Ave., and Sand La.,  
South Beach.
- 16
- 17
- 18
- 19
- 20

#### **Hook and Ladder Companies.**

- 101 Main St., near Broadway, Tottenville.
- 102 Canal, near Wright St., Stapleton.

No.

- 103 Brook St. and Richmond Turnpike, New Brighton.
- 104 1189 Castleton Ave., West New Brighton.
- 105 232 Richmond Ave., Port Richmond.

### BOROUGHS OF MANHATTAN & THE BRONX.

#### Fuel Depots.

- 1 25 Bridge St.
- 2 Quarters Engine Co. 31.
- 3 Quarters Hook and Ladder Co. 8.
- 4 180 Clinton St.
- 5 199 Chrystie St.
- 6 Quarters Engine Co. 30.
- 7
- 8
- 9 Quarters Hook and Ladder Co. 3.
- 10 Quarters Engine Co. 3.
- 11 Quarters Engine Co. 19.
- 12 160 East 33d St.
- 13 Quarters Engine Co. 2.
- 14 Quarters Hook and Ladder Co. 2.
- 15 Quarters Engine Co. 23.
- 16 Quarters Engine Co. 22.
- 17 Quarters Hook and Ladder Co. 22.

No.

- 18 Quarters Engine Co. 53.
- 19 209 East 122d St.
- 20 58 Lawrence St.
- 21 Quarters Hook and Ladder Co. 17.
- 22 Quarters Engine Co. 50.
- 23
- 24 Quarters Engine Co. 52.
- 25 Quarters Hook and Ladder Co. 28.
- 26 Quarters Engine Co. 48.
- 27 Quarters Hook and Ladder Co. 35.
- 28 Quarters Engine Co. 84.
- 29
- 30

#### **Storehouses.**

- 20 Eldridge St.
- 180 Clinton St. (Fuel Depot No. 4).
- 199 Chrystie St. (Fuel Depot No. 5).
- 209 East 122d St.
- Main St. and Westchester Turnpike (Bronx).
- 130-132 West 3d St.
- Repair Shops, 12th Ave. and 56th St.
- 162 East 68th St.
- 226 West Broadway.

**Fuel Wagons.**

No.

- 1 Quarters Hook and Ladder Co. 8.
- 2 Quarters Engine Co. 30.
- 3 Quarters Hook and Ladder Co. 9.
- 4 Quarters Hook and Ladder Co. 2.
- 5 Quarters Hook and Ladder Co. 35
- 6 Quarters Hook and Ladder Co. 28.
- 7 Quarters Hook and Ladder Co. 17.
- 8 Quarters Engine Co. 19.
- 9 133 West 99th St.
- 10 Quarters Engine Co. 53.
- 11 160 East 33d St.
- 12
- 13
- 14
- 15

1

**BOROUGHS OF BROOKLYN AND QUEENS.**

Headquarters—Office of the Deputy Commissioner,  
Deputy Chief of Department. Bureaus—Fire  
Marshal, Violations and Auxiliary Fire Appli-  
ances, Assistant Inspector of Combustibles, Fire  
Alarm Telegraph (Central Office), Medical Offi-  
cers, 365-367 Jay Street.

**Divisions.****No.**

- 10 365 Jay St. (Headquarters).
- 11 127 North First St.
- 12 530 Eleventh St. (Quarters Engine Co. 120).
- 13 621 Central Ave. (Quarters Engine Co. 152).
- 14
- 15

**Battalions.**

- 31 247 Pearl St. (Quarters Engine Co. 107).
- 32 533 Hicks St. (Quarters Engine Co. 103).
- 33 409 State St. (Quarters Engine Co. 126).
- 34 894 Bedford Ave. (Quarters Hook and Ladder Co. 52).
- 35 166 Clymer St. (Quarters Engine Co. 111).
- 36 176 Norman Ave. (Quarters Engine Co. 138).
- 37 650 Hart St. (Quarters Engine Co. 118).
- 38 231 Herkimer St. (Quarters Engine Co. 114).
- 39 243 Hull St. (Quarters Engine Co. 133).
- 40 178 39th St. (Quarters Engine Co. 128).
- 41 Church, near Bedford Ave. (Quarters Engine Co 148).
- 42 18th Ave., near 86th St. (Quarters Engine Co 143).
- 43 West Eighth St. and Surf Ave. (Quarters Engine Co. 145).

No.

- 44 107 Watkins St. (Quarters Engine Co. 131).
- 45 136 Eighth St., Long Island City, Queens (Quarters Engine Co. 158).
- 46 South side Flushing Ave., between 12th and 13th Aves., Long Island City, Queens (Quarters Hook and Ladder Co. 67).
- 47 Rockaway (Queens), Boulevard, near Bayview Ave. (Quarters Hook and Ladder Co. 71).
- 48 395 Fourth Ave. (Quarters Engine Co. 139).
- 49 112 Seigel St. (Quarters Hook and Ladder Co. 58).
- 50 196 Greenwood Ave., Richmond Hill, Queens (Quarters Hose Co. 2).
- 51 Union Ave., between Shelton and Fulton Sts. (Quarters Hook and Ladder Co. 77).
- 52 Lincoln Ave., between Main and Garden Sts., Flushing, Queens (Quarters Engine Co. 172).
- 53
- 54
- 55

#### Engine Companies.

- 101 5117 Fourth Ave.
- 102 201 Van Brunt St.
- 103 533 Hicks St.
- 104 299 Degraw St.

No.

- 105 160 Pierrepont St.
- 106 189 Pearl St.
- 107 247 Pearl St.
- 108 227 Front St.
- 109 159 Graham Ave.
- 110 160 Carlton Ave.
- 111 166 Clymer St.
- 112 136 Wythe Ave.
- 113 137 Powers St.
- 114 231 Herkimer St.
- 115 88 India St.
- 116 11 Scholes St.
- 117 940 DeKalb Ave.
- 118 650 Hart St.
- 119 735 Dean St.
- 120 530 Eleventh St.
- 121 163 South Second St.
- 122 836 Quincy St.
- 123 Foot of 42d St. (Floating Engine).
- 124 274 Hicks St.
- 125 657 Liberty Ave.
- 126 409 State St.
- 127 970 Herkimer St.
- 128 178 49th St.
- 129 246 Frost St.
- 130 59 Ellery St.

## No.

- 131 107 Watkins St.
- 132 Dock foot of North Eighth St. (Floating Engine.)
- 133 243 Hull St.
- 134 1472 Bergen St.
- 135 206 Monroe St.
- 136 Liberty Ave., near Euclid St.
- 137 55 Morgan Ave.
- 138 176 Norman Ave.
- 139 395 Fourth Ave.
- 140 103-105 Prospect Ave.
- 141 242 Bay Ridge Ave.
- 142 Fifth Ave., near 92d St.
- 143 18th Ave., near 86th St.
- 144 West 15th St. and Surf Ave.
- 145 West Eighth St. and Surf Ave.
- 146 East 23d St. and Voorhees Ave.
- 147 60th St. and New Utrecht Ave.
- 148 Church, near Bedford Ave.
- 149 Rogers Ave. and Midwood St.
- 150 Lawrence, near Second Ave.
- 151 Wallabout Market.
- 152 617 Central Ave.
- 153 86th St., near 24th Ave.
- 154 Gravesend Ave. and Avenue V.
- 155 Rogers Ave., near Ave. F.

No.

- 156 124 DeKalb Ave.
- 157 Rockaway Ave. and Ave. F.
- 158 136 Eighth St., Long Island City (Queens).
- 159 71 Gale St., Long Island City (Queens).
- 160 687 Vernon Ave., Long Island City (Queens).
- 161 231 Radde St., Long Island City (Queens).
- 162 78-80 Main St., Long Island City (Queens).
- 163 396 Flushing Ave., Long Island City (Queens).
- 164 332 Central Ave., Far Rockaway. (Queens).
- 165 Arverne, Boulevard, near Ammerman Ave (Queens).
- 166 Hammel's Station, 9 Grove St. (Queens).
- 167 Sea Side, 188 Boulevard, (Queens).
- 168 Rockaway Park, 196 Washington Ave. (Queens)
- 169 786 Union St.
- 170 Willow St., Richmond Hill (Queens).
- 171 392 Himrod St.
- 172 South side Lincoln Ave., between Main and Garden Sts., Flushing (Queens).
- 173 West side Union St., between Railroad and Amit St., Flushing (Queens).
- 174 Junction Madison Ave. and L. I. R. R. Murray Hill, Flushing (Queens).
- 175 10 Orchard St., (Queens).
- 175 10 Orchard St., Jamaica (Queens).
- 176 1635-1637 East 14th St., Brooklyn.

No.

177

178

179

180

- 51 199 Van Brunt St.
- 52 894 Bedford Ave.
- 53 183 Concord St.
- 54 181 South Third St.
- 55 648 Pacific St.
- 56 124 Greenpoint Ave.
- 57 40 New Jersey Ave.
- 58 112 Seigel Ave.
- 59 633 4th Ave.
- 60 264 State St.
- 61 399 Halsey St.
- 62 1171 Madison Ave.
- 63 Rogers Ave., near Midwood St.
- 64 5211 5th Ave.
- 65 138 8th St., Long Island City (Queens).
- 66 701 Jackson Ave., Long Island City (Queens).
- 67 Flushing Ave., between 12th and 13th Aves.,  
Long Island City (Queens).
- 68 365-367 Jay St. (Water Tower No. 1).
- 69 69 Washington Ave.
- 70 109 Watkins St.
- 71 393 Boulevard, Rockaway, Hollands (Queens).

No.

- 72 542 11th St.
- 73 423-425 Ralph Ave., near Bergen St.
- 74 394 Himrod St.
- 75 Spruce St., between Atlantic and Fulton Aves.,  
Richmond Hill (Queens).
- 76 98 Irving Pl., Jamaica (Queens).
- 77 17 Union Pl. (Queens).
- 78 152 Greenpoint Ave.
- 79 Grove St., 250 feet west of Main St., Flushing  
(Queens).
- 80 225 16th St., College Point (Queens).
- 81
- 82
- 83
- 84
- 85

#### Hose Companies.

- 2 196 Greenwood Ave., Richmond Hill (Queens).
- 3 61 Bandman Ave., Jamaica (Queens).
- 4 19 Rockaway Rd., Jamaica (Queens).
- 5 6 John St., Jamaica (Queens).
- 6 17 Harriman Ave., Jamaica (Queens).
- 8 227 16th St., College Point (Queens).
- 9 518 5th St., College Point (Queens).
- 10

No.  
11  
12  
13  
14  
15

**Repair Shops.**

St. Edward and Bolivar Sts. (Searchlight, No. 1).

**Training Stables, Etc.**

St. Edward and Bolivar Sts.

**Coal Depots.**

127 North First St.

## CHAPTER XI.

### SOME DONT'S FOR CANDIDATES.

Here are a few Don'ts that candidates about to be examined mentally should remember.

First: Don't talk in the examination room. From the moment you enter until you leave the room don't exchange a word with any fellow candidate on any subject whatsoever. If it is necessary for you to ask a question catch the eye of an examiner or monitor and put your question to him.

Second: Don't drink any alcoholic stimulant before the examination nor during the recess for luncheon. It is a delusion to think that strong drink will help one in a mental contest, or physical either. In past examinations men have been disqualified for showing up under the influence of liquor, and quite a number, it is reported, were rejected in the recent medical test for the same reason. Only when the mind is clear and normal can candidates do their best in a mental or physical examination.

Third: Don't write your name anywhere on any examination paper. Attached to the first paper that shall be handed you before the test will be found a stub. Place your examination number on this stub

and nowhere else then or at any other time during the examination. If you violate this rule the chances are that your papers will be thrown out.

Fourth: Don't waste time filling out your preliminary sheet. Do it as quickly as possible. This paper is not rated and you will need every available moment to work on the papers that are rated.

Fifth: Don't attempt to use any other than black ink. If you do your papers will not be rated.

Sixth: Don't be too particular with your handwriting. Remember that neither handwriting, spelling nor composition count in the ratings. All things being equal the man who writes most on the subjects given stands a better chance in the rating.

Seventh: Don't give all your thought and care to the first subject and neglect the second at either the morning or afternoon session. The papers in the morning will be on "Administration," and "Report," in the afternoon on "Rules," and "Laws." The last two have the same weight. Remember that if certain facts are not written down on your papers the examiners have no means of knowing whether or not you are familiar with the subjects. Take pains to answer fully each question asked. It is advisable to have your watch with you and regulate your time on each subject.

Eighth: Don't neglect your lunch. If you have but fifteen minutes time to get a sandwich and a cup of

coffee this nourishment may materially increase your chances of success. Without it the mental strain of the examination may give you a headache in the middle of the afternoon and unfit you to think clearly and concisely.

Obedience to the aforementioned don'ts is vitally to the interest of every candidate.

## CHAPTER XII.

### POINTERS FOR CANDIDATES.

The State Fire Marshal of New York has issued the following "Nevers" and "Always" which every candidate for fireman should read and commit to memory.

#### NEVER.

1. Never put your trust in a fireproof building—remember that the contents are not fireproof.
2. Never insure your property for more than its value.
3. Never permit a stove to be set up without a metal protection being placed on the floor under the stove.
4. Never permit a stove pipe to come in contact with a partition—see to it that there is an open space around it.
5. Never allow swinging lamps or gas brackets near a window.
6. Never use paper shades or paper or cotton decorations on your lamps.
7. Never use cotton or other flimsy material for decorations either in store windows or on Christmas trees.

8. Never allow children to light candles on Christmas trees.
9. Never throw hot ashes in a wooden barrel or in alleys or on the street nor permit them to be piled up against buildings or fences.
10. Never start a bonfire near a building.
11. Never permit a child to start a bonfire or go near it.
12. Never permit rubbish, greasy rags, paper and useless waste to accumulate in and around buildings.
13. Never put kindling wood in the oven.
14. Never hang clothing near the stove or stove pipe.
15. Never smoke in bed.
16. Never throw a lighted cigar, cigarette or ashes from your pipe in a place where it might start a fire.
17. Never light a match unless you want to start a fire for something that is needed.
18. Never leave matches around where children can reach them.
19. Never permit children under age to play with matches.
20. Never light a match in a closet or attic where clothes are kept—the head of the match may fly off and set the clothing on fire.
21. Never use any kind of a match except a safety match.

22. Never permit gasoline, benzine or naphtha to be kept in the house.
23. Never permit gasoline, benzine or naphtha to be kept in anything but an airtight metal can, painted red.
24. Never allow anyone to wash clothes or other articles in gasoline, benzine or naphtha in the house.
25. Never throw gasoline, benzine or naphtha into a sink, cesspool or sewer.
26. Never start a fire with kerosene oil, benzine or naphtha.
27. Never fill a lamp or gasoline stove when it is lighted.
28. Never throw water on flames which start from kerosene oil, as it tends to spread the blaze. Smother the flames with a rug, quilt or heavy clothing.
29. Never clean beds with highly inflammable liquids.
30. Never polish a stove while there is any fire in it.
31. Never leave a lamp burning when you leave the house.
32. Never leave a lamp with the light turned down low—it is liable to cause an explosion.
33. Never celebrate the Fourth of July by shooting toy pistols, fire-crackers, Roman candles, skyrockets and other dangerous explosives.

**ALWAYS.**

1. Always study to prevent fires in your house or place of business.
2. Always give attention to fire prevention—"an ounce of prevention is worth a pound of cure."
3. Always remember that to have fire prevention in your home is better than to mourn over the remains of your beloved one or the sympathy of your neighbors over your loss.
4. Always remember that a house of merriment is better than a house of mourning.
5. Always be prepared to put out fires before they become dangerous.
6. Always be prepared in case of fire to save every person in your building—plan before the fire occurs.
7. Always know where the nearest fire alarm box is situated, and keep the call number of your fire department in plain sight near the telephone.
8. Always call the fire department as soon as the fire is discovered.
9. Always see that fire drills are held at least once a week in every institution, school or factory.
10. Always keep your supply of matches in a metal box throughout the house.
11. Always remember that the flames of the match, improperly, carelessly, thoughtlessly or wantonly ap-

plied, result in the destruction of property and in death.

12. Always extinguish a lighted match before you throw it away.

13. Always insist on having an outside shut-off attached to your gas supply pipe so that the gas may be turned off from the street.

14. Always avoid rubber hose connections for your gas stoves.

15. Always see that all kerosene oil is kept in a closed metal can in a safe place.

16. Always see that all lamps are filled by daylight, burners kept clean and wicks changed often.

17. Always have your chimneys, stove pipes and stoves examined and cleaned once a year to avoid any danger of fire.

18. Always see that your stove or range is in good condition and that no spark or live coal can fall on the floor.

19. Always see that all ashes are placed in a metal tightly-closed receptacle.

20. Always keep your buildings clean and free from rubbish, etc.

21. Always have a full pail of water on each floor in the house to put out a starting fire.

22. Always insist on fire-resisting material to cover the roofs of your buildings—a shingle roof is the best kind of a fire catcher.
23. Always keep fire escapes in good condition, well painted and clear of all obstructions.
24. Always have your steam boilers examined twice a year.
25. Always have a stationary iron ladder leading to the roof of your building permanently in place instead of a movable wooden ladder.

### CONCLUSION.

Always remember that all fires are the same size at the start.

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